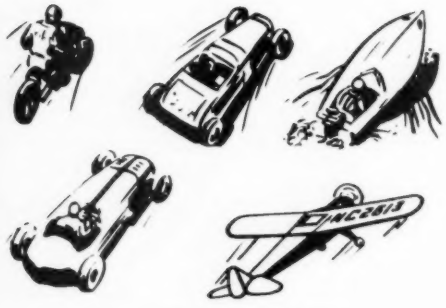
MODEL AIRPLANE NEWS

SEPTEMBER 1952 — 25 CENTS

MORE SPEED RECORDS



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WITTICH HOLLOWAY, Art Director

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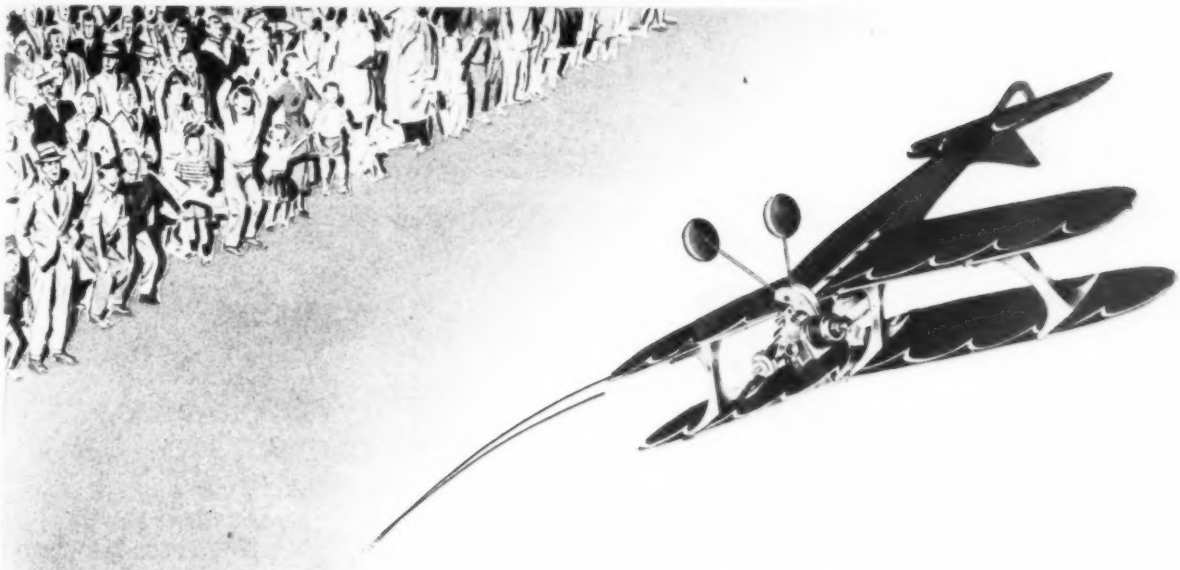
by William Winter

▸ A favorite plot of the science fiction writers concerns a guy who finds himself the only man left on earth. We have this weird sensation in the evenings when we go out to fly. Beautiful, quiet, summer evenings, and not a model builder in sight. In the Connecticut hills, we at least had a few cud-chewing cows to impress. All winter long, the Long Island modelers turned out to fly, shiver and shake. They hibernate in the warm weather. Then at winter sessions about the fire they exclaim, "Boy, those lucky Californians, no wonder we can't keep up with them."

▸ This is (or was) the time of the year when the Wakefielders have at each other. After visiting the Wakefield quarter finals at Hadley Field, N. J., all we can say is that this is an event to separate the men from the boys. Hadley Airport used to be the site of the old Eastern States contest when it ranked with still important meets like the Western Open. Way back, the night flying, air mail DH's used Hadley as the New York-Newark Terminal. We modelers found it a place of fantastic thermals. Wings that were left on the ground would take off by themselves and twirl out of sight in thermals. Hadley also reminds us of the time Ben Shereshaw offered the sponsorship of the Eastern States contest to two magazines. They both accepted. But the contest went over. Today, the *Guided Missiles,* the rc group from Elizabeth and thereabouts, are permitted to use an adjacent field because they "have control" over their airplanes. They, too, fly on weekends. So there was much "wisecracking" back and forth between the rc'ers and would be tourists of Sweden. We flew *Windy Joe* during the afternoon while Frank Yuhauz and Fran McElwee test-hopped a couple of jobs. But as the rubber boys got set for zero hour, we all wisely put the rc's away to see some real flying under pressure.

▸ The first round was scheduled for seven o'clock Saturday night. Two more would be run off early Sunday so that thermals would play little or no part in winning flights. After the dismal weather in the east last year, wind and rain, the boys foolishly hoped for a break. It rained but at least wasn't windy. Saturday night that is! MAN at Work was on the scales. Interesting bit, this, because all Wakefields are overweight. Why scales? No one knows. Even Querman, who has made lightweight construction a science, tipped the scale with a few grams to spare. Most others were ounces overweight. As many contests as we have viewed through the years, still get vivid impressions of the take-offs. Tension is terrific. Here's where you see rubber wound as it never was wound before. Guys get lead arms when half wound. One had to be rescued before it wound him! And you can't tell who will get off. New fangled long jobs and dainty landing gears with massive 20 inch props make it a chore. Good men get eliminated in a split second and after months of building and testing. Like Bill Fletcher. Broke one ship on first take-off, another on the second, and combined parts for third attempt. No dice. We were shaking. If good intentions counted, the guys would have rooted Bill into a five-minute flight.

▸ Flights ran between two and three minutes. Al Von Wymersch would have hit three with a geared job got lost to sight behind trees. Al—and this floored us—is giving up Wakefields. This after a life dedicated to the elite rubber jobs. How come, we asked? Well, you have got to wind them to full capacity for reliable testing and they go too far. Need really big fields. Al is taking up radio. Bet that Al just can't chase 'em anymore. Like us. (Wait until you chase an rc, Al!) If we had to build a Wakefield, sure would put a good gear on it, takes less performance but be sure of a flight. Not too long, either. Real long jobs didn't appear to pay off, at Hadley, anyway. Transition not too good and dipsy doodles in the glide. Long, yes, but not super long. With real bad weather brewing for Sunday, went home. Phone calls on Monday to say they were (*Continued on page* 8)



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Scrap ...Box

by Jim Saftig

What's cooking? F.A.I. speed trials in California, hijinks in Ohio, super duper scale stuff, design dope.

▸ Comes now, the F.A.I. speed trials, to be held at Miramar Auxiliary Air Field, San Diego. What's the F.A.I.? The F.A.I. is the sole international sporting body qualified to establish and enforce the application of rules with the object of encouraging and governing sporting meetings and air records; it nominates the international appeal tribunal to judge finally any differences which might arise regarding the application of the rules. The full name per the "book" — Federation Aeronautique Internationale — Code Sportif de l'Aeromodelisme (Sporting Code for Model Aircraft). The F.A.I. is the official body that governs the "world's records" established in several different categories whether it be real aircraft, boats, race cars, etc. We, naturally, are more interested in the model airplane aspects of the F.A.I. so will dwell on them in a sketch-like form. The World Record U-Control Speed Trials to be held at Miramar are as follows: Class 1 — .01 to .152 cw. in or .01 to 2.5 cc; Class 2 — .152 to .305 cw. in or 2.51 to 5.00 cc.; Class 3 — .306 to .6102 cw. in or 5.01 to 10.00 cc. Jets — less than 500 gr. bar engine weight. Flying Wing Models — same classes as above. A.M.A. rules on line diameter will be used at the above mentioned speed trials mainly for a safety factor. Line lengths to be the below listed minimum but can be the next longer size: Class 1 — 37.3 ft., 141 laps; Class 2 — 43.5 ft., 12 laps; Class 3 — 52.3 ft., 10 laps or 65.3 ft., 8 laps.

U-Control speed records, classified as speed records in a circular course are recognized in two types: 1 — Records for machines driven by mechanical motors, 2 — Records for machines driven by reaction motors. The only models which will be accepted for these speed records will be those for which the control cables are: a — held by the hand; b — attached to central pivot. In the case of machines controlled by hand, the wrist of the competing modeller must, during the duration of the flight submitted as a record, rest on a central support termination in a fork and pivotted on a rigid mast. This means our ordinary pylon. The speed will be timed over a minimum distance of 1 kilometre. The pilot may have time started after a predetermined number of laps have passed, or he may time in when he thinks his model has attained top speed. A speed record in a circular course cannot be beaten except by a flight exceeding the existing record by 10 kilometres per hour. Records at present are as follows: Orthodox Models Classes 1, 2, 3, and Jet — 90.038 m.p.h., 119.452 m.p.h., 132.091 m.p.h., and 128.374 m.p.h. respectively. Flying wings in the above mentioned classes are: 41.562 m.p.h., 96.629 m.p.h., 101.561 m.p.h., and 120.143 m.p.h. Engines which exceed the records will be impounded for displacement checks to be made by the National Bureau of Standards in Washington, D. C.

In straight flight, the speed is measured on a course of 50 metres (164 ft.) for rubber driven models, and on 100 metres (328 ft.) for models driven by mechanical motor(s). This course must be traversed in flight in both directions and both flights must be made within an interval of half an hour. The time is taken as the machine enters and leaves the course. The mean of the two speeds produced gives the actual speed. The timing of speed records and the periodical checking of the automatic timing apparatus must be made in conformation with the rules laid down in the "Code Sportif." In regards to the measurement of time, per direct timing, for trials, races or contests, the time must be measured by a timekeeper possessing a chronometer of first or second class, or by an assistant timekeeper. The times must be entered on a timesheet in ink during the trial and signed by the officiating timekeeper. Only these times will be officially recognized.

▸ Frank Pavliga, Secretary of the "going gang", *Northeastern Ohio Model Engineers* (NOME for short), gave us a re-cap of "doings" through the past winter. Most of the winter months were spent participating in interclub microfilm and and tissue contests. Pylon racing held the spot too, even though the club is primarily a free-flight group. Many a cold Sunday morning was spent flying rc but the experience gained was well worth the frostbitten toes and fingers. We are "spotting" the NOME gang because of their interests in promoting model aviation. They have formed chapter units of their club in surrounding towns. These chapters are composed of modelers and would-be-modelers below the age of 18. Regular classes on model design and flying are conducted each Saturday, and if anyone thinks model design is too technical a subject to be teaching such an age group, let's dispel the phony notion. If you're going to develop a crop of good modelers, you have to get them interested in the meat of the subject. Don't try doing it in the way an ordinary school class is conducted. Kids get enough of this in regular school (so they think). Solution — have problems arise during regular flying sessions with them. Back in the classroom, explain them thoroughly, tying them in with the particular situation that actually presented itself with an actual model. It really works! For Pete's sake, don't jam it down their throats with a ram-rod! Perseverance is a must. At a particular session, only one student showed up. Call it a day?

(*Continued on page* 41)

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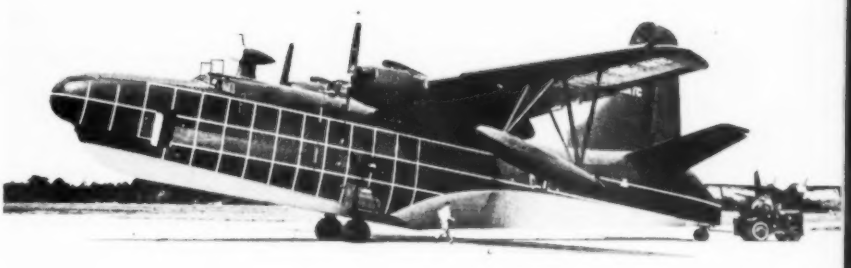

Martin M-270 has a 15-to-1 length-thickness hull ratio. Check lines same as tow tank models.

by DAVID ANDERTON

With supersonic flights a routine matter, the Air Force has got some very novel trainer ideas.

Martin XP5M-1 showing long afterbody. Obtains better water stability, and aerodynamic qualities.

▸ Tomorrow's trainers are going to make today's fighters look like *Cubs*. In the deck for the Air Force is a two-seater for training pilots in the gentle art of beating the speed of sound. Such a craft would be added to a complete new roster of airplanes which echoes a new line of thinking in pilot training.

It starts like this: The fledgling gets his first time at the stick of the North American *T-6G* which, in earlier models, has been teaching the Air Force how to fly since 1938. The student graduates to the North American *T-28*, a bigger and better replacement of the *T-6*. Before the pilot leaves basic, he may fly still a third plane. All this is the primary training program. On the average, it takes about 360 hr. to complete.

Now there is always one big disadvantage to changing mounts in midstream. You've got to learn the ways of the new horse first before you can expect to do trick riding. So it is with airplanes. It's probably safe to say that the *T-6* and *T-28* handle differently in the air, in spite of the fact that they are sister craft from the same factory and design teams.

So the new pilot, who has just gotten used to reaching here for the flap handle and there for the landing gear has to learn to reach there for the flaps and here for the landing gear. What happens? Well, sometimes he cracks the airplane. Sometimes he just gets a little confused. But the sum total of the differences between the airplanes boils down to one thing only: It takes him more time to get through primary, because he's got to spend some of that time getting used to a new environment.

The Air Force has been studying the problem from a lot of different angles—teaching, learning, medical, psychological—and has come up with some of the first answers. One of the AF's ideas is that primary time could be reduced by about 100 hr. if we had a single trainer type for the complete program.

So they've begun to set out a specification for a new plane which is being called Trainer X. In general the plane is expected to combine the good features of the North American jobs. It's to have side-by-side seating, and World War II fighter performance. Instrumentation is to be complete. Then to make things tough, the Air Force said the gross weight should be under 4,000 lb. The craft is required to have tricycle landing gear.

There is one slight delay in the design program now. The Air Force has not yet finalized the engine types for Trainer X, although jet, piston engine and turboprops will probably all get the nod.

And there's another angle to this Trainer X competition: The AF feels that the plane, besides being a useful design in a new program, will also be the prototype for an even better trainer—let's say, just for fun, Trainer Y. Trainer Y is expected to have high subsonic performance and this, of course, would be rather unusual for a primary trainer. But it reflects the thought of the Air Force that someday its fighters are going to be so hot that the trainers for them will also have to be pretty warm.

That kind of thinking—and the new ideas for training—naturally leads to a supersonic trainer. As things are now, the pilot who wants to see his Machmeter needle slide past 1.0 has got to make the ride alone. Back not too long ago, such a procedure was just asking for it. But now, the Mach 1 mark is no mystery to lots and lots of pilots, Navy and Air Force.

So the AF would like a two-place job which can slam through the sonic drag rise. This way the pilot has somebody along to tell him what to do, how to do it, and to chew him out afterward for missing something.

This should produce some interesting designs sometime in the near future. But until there is a completely new job to be had, the AF is going to try to modify some F-86's to do a temporary job. Tomorrow's trainers should be pretty interesting ships. And tomorrow's fledgling pilots may start out on the stuff that today's pilots are flying in combat. Gives you a turn, doesn't it?

▸ *Whacking Big Workhorse* — The Piasecki people have just released the dope on their new *H-21* basic helicopter, the *Work-Horse*. There are to be four models of the big, two-rotored craft. The *YH-21* and the *H-21A* are for the Air Rescue (*Continued on page 44*)

Newest Navy F2H-3 Banshee, has improved radar to help accomplish combat missions, all weather.

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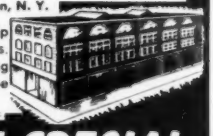

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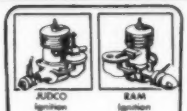

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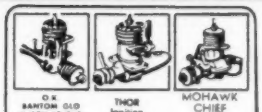

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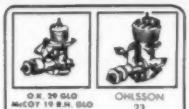

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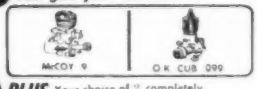

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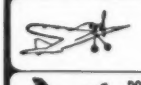
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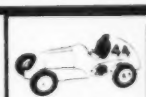
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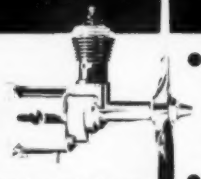

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Man At Work

(*Continued from page 2*)

drowned out. From there on followed the box score by phone. Al Van Wymersch was on top that Saturday but next week couldn't get off. Bon Nelson ended up number one for the semi-finals at Baltimore.

▸ When the guys from Ohio and environs—Korda, Elgin, Kolb, etc. — met with easterners and southerners like Perryman and northeasters like Jimmy Tagney (Navy boy who flies Wakefields all over the world and "made" the English team in their eliminations last year), and Lou Andrews, the Barnstormer man, the fur really flew. After three impressive flights of about 4:10, 4:19, and 4:19, Korda still didn t make the team! They say it was tougher than last years Finnish finals. Tagney and Cliff Montplaisir came out on top, to pair off with Ed Lidgard and Carl Perkins, Jr., from the midwest, and Joe Bilgri and Syd Seldon from the west. With a choice of three semi-finals to cover, M.A.N. gave the nod to the west this year. Virgil Cone's amusing story and swell pictures will be found on pages 14-15.

▸ MAN at Work (the "pro") was a judge in rc at the Mirror Meet. It is very odd the vastly different impressions you get of contests when you are working, not flying. The Mirror has this meet organized down to the last pencil. For instance, a guy on a motor scooter comes around in the morning to check off numbers on helmits to be sure all judges and timers really showed up. Air scouts, also on motor scooters, pick up messages at regular intervals so that flight times are entered almost as fast as rung up. Overwhelmed by it all. Still, the entrants gripe and beef, as always. Always thought this was a bad sign. But once the boys gripe about your contest, you can be sure they have accepted it. Modelers really think the contest belongs to them — and maybe it does! Belonging to them, they want no foolishness from the management, judges, timers, even the cops. The first free flighter that sees the pearly gates is sure to tell St. Peter off.

▸ Radio was sad. Wished we were flying, not watching. Trouble was that 27.255 got around just too late for fliers to get acquainted with it. No one but hams would fly on 52-54, of course. Though 465 is top dog in some sections, not too many showed at the Mirror. Outside of three fliers, or let's say about six fliers and three airplanes, it was wide open for any guy who could fly upwind in a breeze.

▸ It took a trip to Philly for an "Open House," put on by the Philadelphia Model Hobbies Association, to drive home what happened to indoors. During an entertaining evening, oldtimer Victor Fritz put on a live demonstration, using an indoor model and a CO_2 job which he flew tether. Victor had an entralling running commentary of things back when, of famous modelers and models, and great flights (like Bassett's endurance flight for 180 miles over three states, crossing the Delaware four times). So he told them about indoor models, then launched this little job which circled slowly over upturned heads. When it was all over, he asked for a show of hands from those who had never seen an indoor model before. The place was a sea of hands. This Open House is a real deal. Guys buy tickets for 50¢ from their dealers, then the stubs are good for 50¢ merchandise credit. Fellows enter models in a Beauty Event. Prizes awarded during an intermission. Two movies: one, a British picture, was a wow. Door prizes. Prizes for practically anything—including the first modeler with a hole in his sock, with a red tie. Idea is so good that a similar association in New York City plans an "Open House" in the fall. Other cities could try the same idea. It's not every day you can get a Fox 35 for having a hole in your sock.

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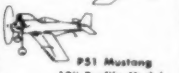

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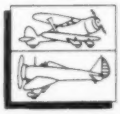

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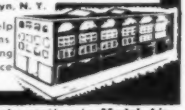

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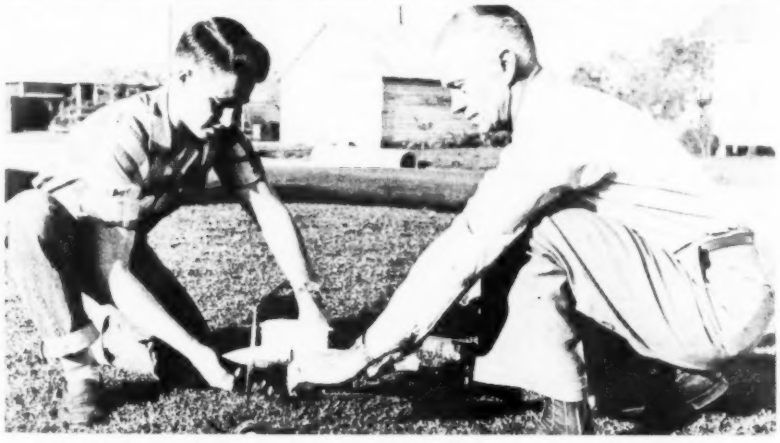
Under Dad's watchful eye, Harry mounts his Mac 60 in the fastest plane at Nationals. Although pop gives advice on really tough problems, like machining, Harry does his own building.



by HARRY FIEGEL, JR.

One of the big thrills of the 1951 Nationals came when 15-year-old Harry Fiegel, Jr., of Texas City, Texas, won the Junior Class D speed event with a flight of 148.88 mph, beating the winners of both the senior and open divisions. His topping the speeds of the hard-boiled top hands was a remarkable achievement. Here is the story up to the flight.

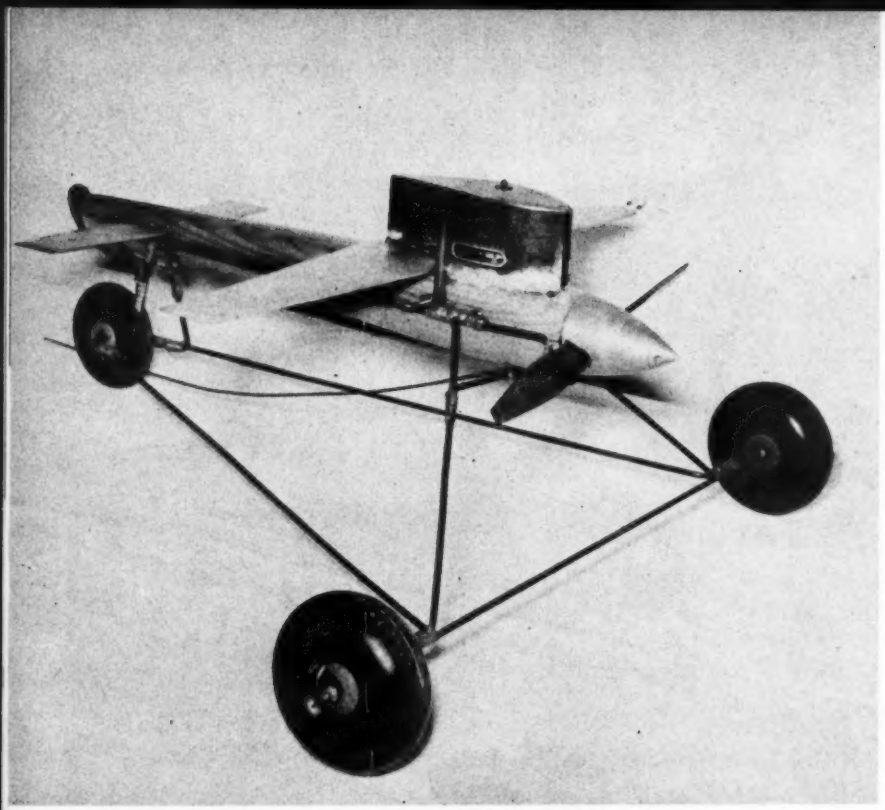
▸ When I flew my D job at 148.88 mph to take a first at the 1951 Nationals, the fastest time at the meet, my friends were surprised. So was I.

I never dreamed I would win at Dallas. Nineteen fifty-one was my second year of Nationals competition. The year before I hardly knew which end was up, everything had seemed so confusing. But '51 was a little better. The ship itself was a new one, so new, in fact, that it had made only three flights. The second had been a crack-up, so that the third, made after repairs, was my big flight at Dallas. Some people were surprised that a junior could have a faster time in D than either senior or open contestants. I think it only proves that more people can fly speed!

Speed competition appeals to me because it gives a yearly objective to shoot for. Right now I am trying to get more out of my B and C jobs, trying propeller changes, watching the engines, always trying for that added mph. I didn't start out on speed, though. I entered a stunt job in a Plymouth meet about four years ago and was lucky to win a first. That fired me up to try for speed.

My first ship was a trainer. That was seven years ago when I was nine years old. Since then most of the models were of my own design and I entered them in about 40 contests. You have to enter contests to get experience and to win. The first contest I ever entered was a Plymouth contest in Houston, where I tried stunt and beauty. I didn't place in either event. In fact, I didn't even get a ship off the ground.

Speed was tough for me until two years ago. Previous to that all my speed jobs were big and sluggish — incidentally, that is the way you should learn to fly speed; start with bigger, easier-to-fly jobs and then pare them down in later designs still using the same size engine. *(Continued on page 36)*



Study in plane and dolly design. Uses metal bottom, Dooling engine. Note dolly trigger wire.

The Bounder

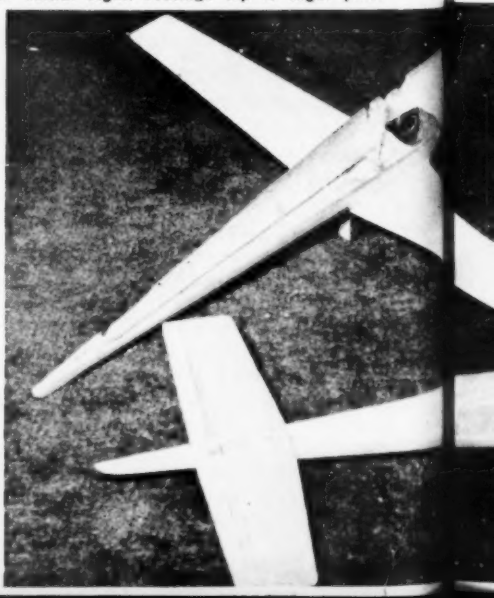
by HERBERT DAVIS

▼

Now that you have decided that if young Fiegel can do it you can do it too, here is a national double record holder, and a two event winner at the 1951 Nationals. Its designer, a senior, was a high point winner at Plymouth and also Tangerine Internationals held last year.

Herb with a Class B Bounder, here described. Speed at contests never dropped under 124 mph.

Below — Extra large tank capacity guarantees an official flight. Fuselage top is sugar pine.



▶ A lot of you free flight fellas say that speed and free flight don't mix. In a sense, this may be true, but I would like to give you some reasons why it might be a pretty good idea to mix the two. First, most of your local meets are held for two days — one for free flight, and one for speed. Think how much more enjoyable it would be to enter both events, instead of hanging around waiting for your event to take place. This applies to big meets also which last several days.

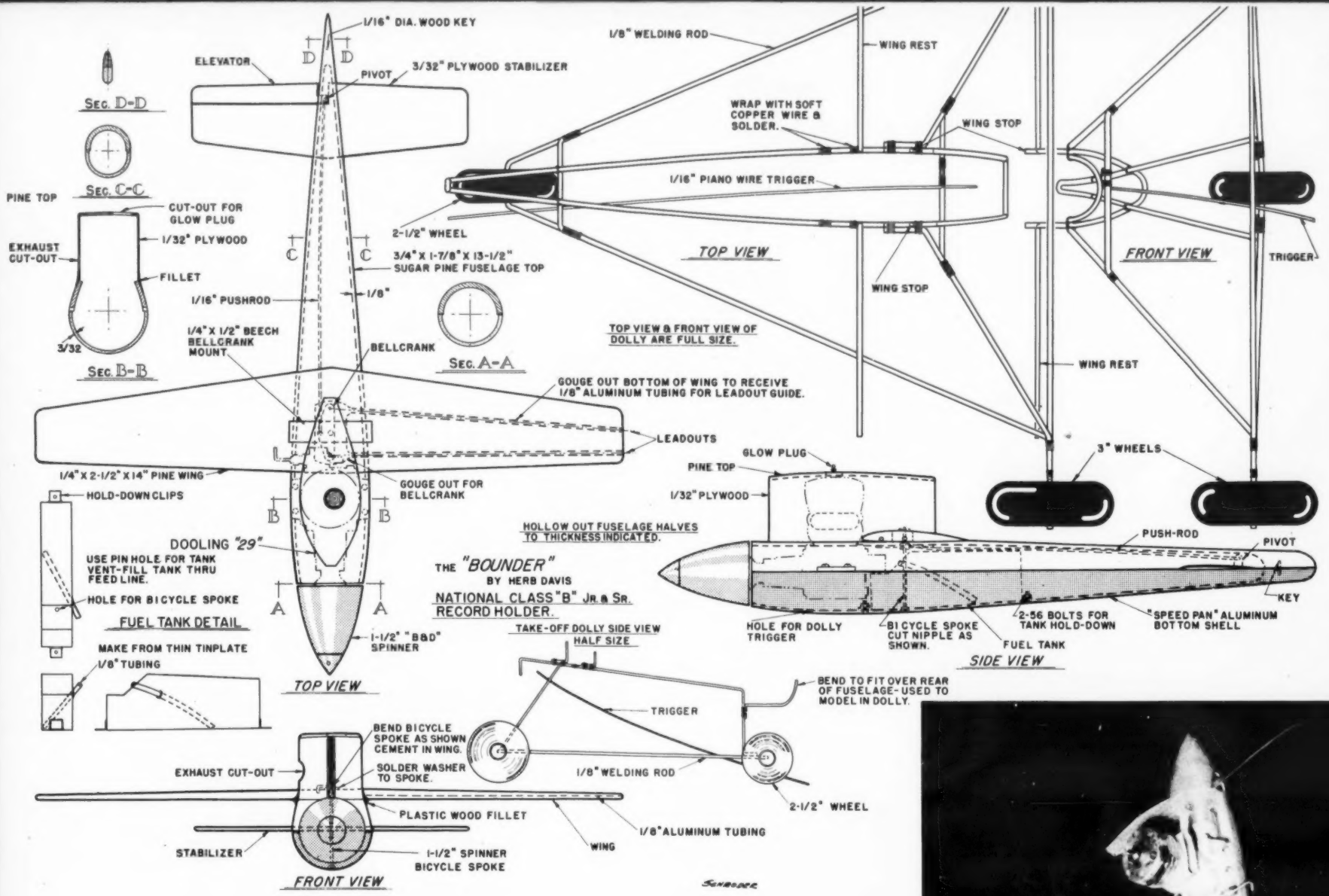
I always enjoy taking along my free flight ships to the various meets. Secondly, and very important, is a practical side of flying speed along with free flight. Almost every meet held gives a high point trophy. Look at the additional points you can get flying speed even if you do not place high. My experience at the '49 Internationals taught me this. I won the Junior High Point by a margin of one point, and if I hadn't flown rubber, in which I placed fourth, I would have lost.

I have flown all classes of speed and jet in one day easily. You will find speed very fascinating after you try it. The cost of construction is very small. My airplanes cost me less than a dollar and a half to build. Every ship that I flew last year is in perfect condition. The main problem of speed jobs becoming oil soaked has been licked through the use of the metal-bottom half.

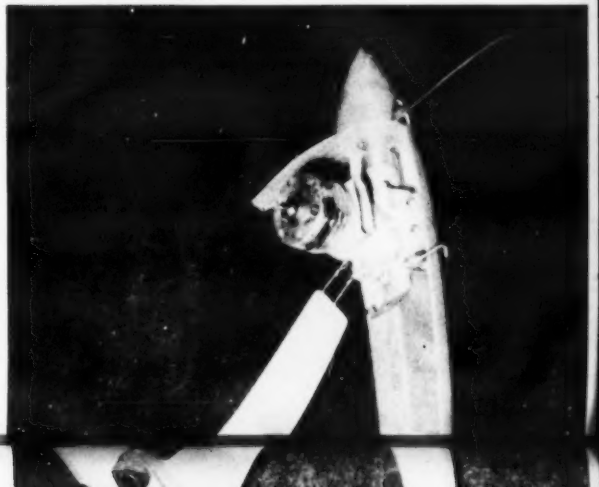
In 1949, I found that the metal-bottom half picked up speed due to a cooler engine run and less vibration. I proceeded to build my airplane around the metal-bottom. The first ship I built gave good speed but was uncertain on the take-off. The metal-bottom half plane was heavier and so required a longer run to take-off, so I designed a suitable trigger locking dolly to assure a safe take-off. It has worked without a flaw.

Knowing that the metal-bottom and this type dolly were the best for my design, I began to polish off the design. I began to cut down on wing area as much as possible to reduce weight and drag, and increase stability of the model. I did the same to the stab.

I considered that pine wings and top (*Continued on page* 42)



FULL-SIZE PLANS FOR BOTH "THE BOUNDER" AND "THE ZEPHYR" AVAILABLE. SEE PAGE 52.



air ways

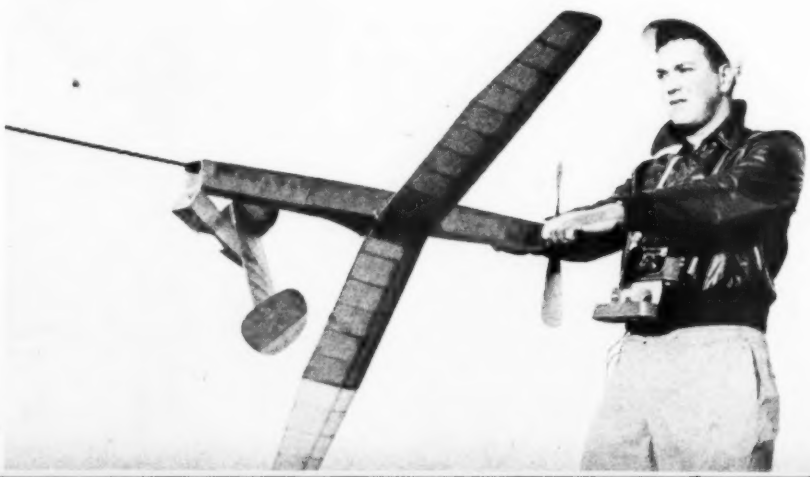
at the West Coast Wakefield Eliminations

Joe Bilgri's *Duster*, February '52 MAN, racked up 847.7 seconds. Joe, on crutches, let Manny Andrade do flying. After ground loop on second try, Syd Seldon, right, placed second with spare job.

Manny Andrade gets nose block in place before releasing Bilgri's model. Note use of temporary rod at rear to give helper something to hang on to.

Below—Syd Seldon's job was another long one, used dihedraled wing, and a retractable landing gear.

Below—Dick Baxter's job featured front gearing and a 14-inch propeller that turned at four times motor speed. Motor run was three minutes. Good first round, lost on collision on second.



Don Kennedy holds for Cummings as Frank winds one motor at a time. This was one job that timers should identify quickly in the air!

Frank Cummings, and ultra lightweight "P-38." Damaged second round take-off. Despite its 3:18 two-flight average it would not have placed.

▸ Once again the West Coast has selected two good men to represent us on the American Wakefield team. Joe Bilgri of San Jose and Sydney Seldon of Tacoma are two topnotch men in Wakefield circles.

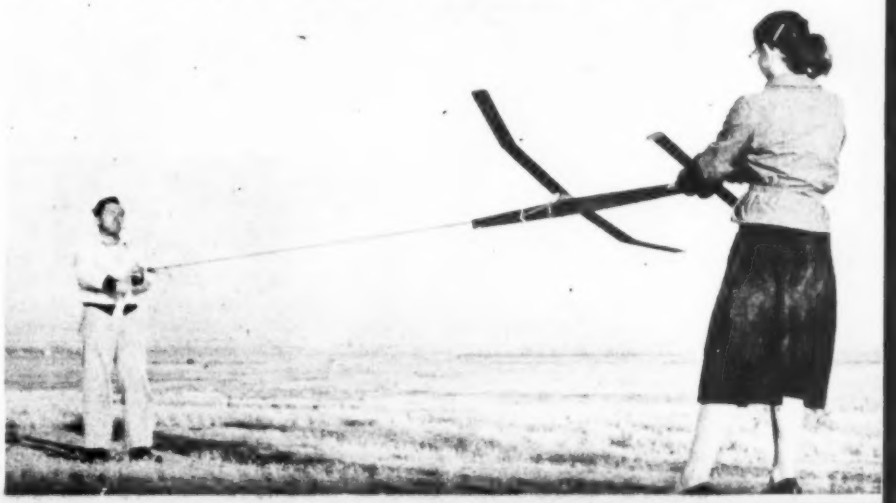
Joe has plenty of rubber modeling experience behind him, having been a consistent winner in many major contests, including the Nationals. The *Duster* Joe flew in the semi-finals is the same one published in the Feb. 1952 issue of M.A.N., the only modifications being in rudder and prop design. Joe had an unfortunate accident just before the contest, having dropped one of those "Bay Area dethermalizers" (50 lbs. of dry ice) on his foot. This little episode put him on crutches for a few weeks and necessitated the use of a proxy flier; who could do a better job than Manny Andrade, member of last year's team. Manny did a masterful bit of flying with Joe's airplanes, and though Joe looked a bit shaken when it was all over, I am sure he will recover in time for the big trip.

Syd Seldon did some very smooth flying with his models. The ships were very clean and simple, with a single motor, folding prop and retractable gear. These airplanes seem to be very consistent and will bear close watching in Kungungsund, Sweden this year.

The semi-finals were held in Bakersfield, California. The weather was warm and clear. This is probably one of the best contest sites in the country, judging by the national records set there. The selection of this site brought moans and groans from the northern contingent, and I can hardly say I blame them, but when we glance at the map it is obvious that Dick Everett had (*Continued on page* 50)

By dawn's early light, Ed Slobod and Andy Faykun turn out for last minute flight tests. But Ed's ship was clobbered by Baxter's in take-off collision before he could even get into the air. So it goes.

Below—Hal Roth, Mrs. Roth for "anchor," struggles to wind the long motor. (Eastern modelers, note that flying area.) Hal's 670.1 seconds for third was over two minutes shy of making the team.



For tops in performance and sensible construction, try this stand-out Half A. It has a swift, stable climb and maximum duration. Does 2-1/2 minute minimum.

▼

Left — The *Zephyr*, held by Sal, is typical of the planes he has flown to many places on both coasts.

Below — Rising swiftly from Sal's opening hand, the *Zephyr* grabs for the sky. Uses any of the .049's.

by SAL TAIBI

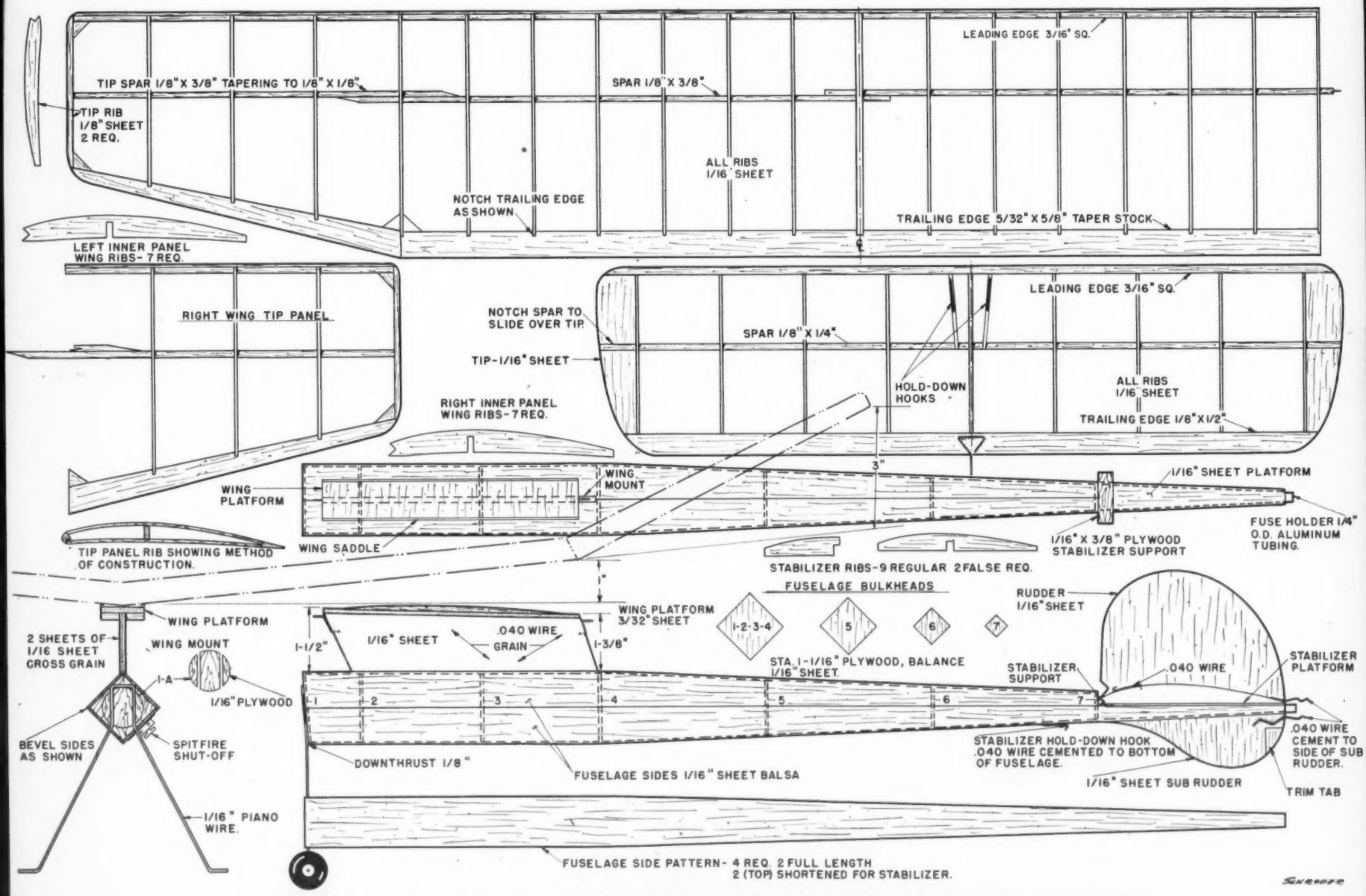
The Zephyr

The Zephyr is a high performance Half A contest type model, capable of swift stable climb and high duration. With the advent of more and more powerful engines this class has ceased to be a cute, just-for-fun class. These small models are capable of just as high a duration as the larger ships. At the 1951 Nationals the first four places in class Half A compiled a three-flight total of better than 20 min. The *Zephyr* is our attempt to boost the already fine performance in this class a little higher.

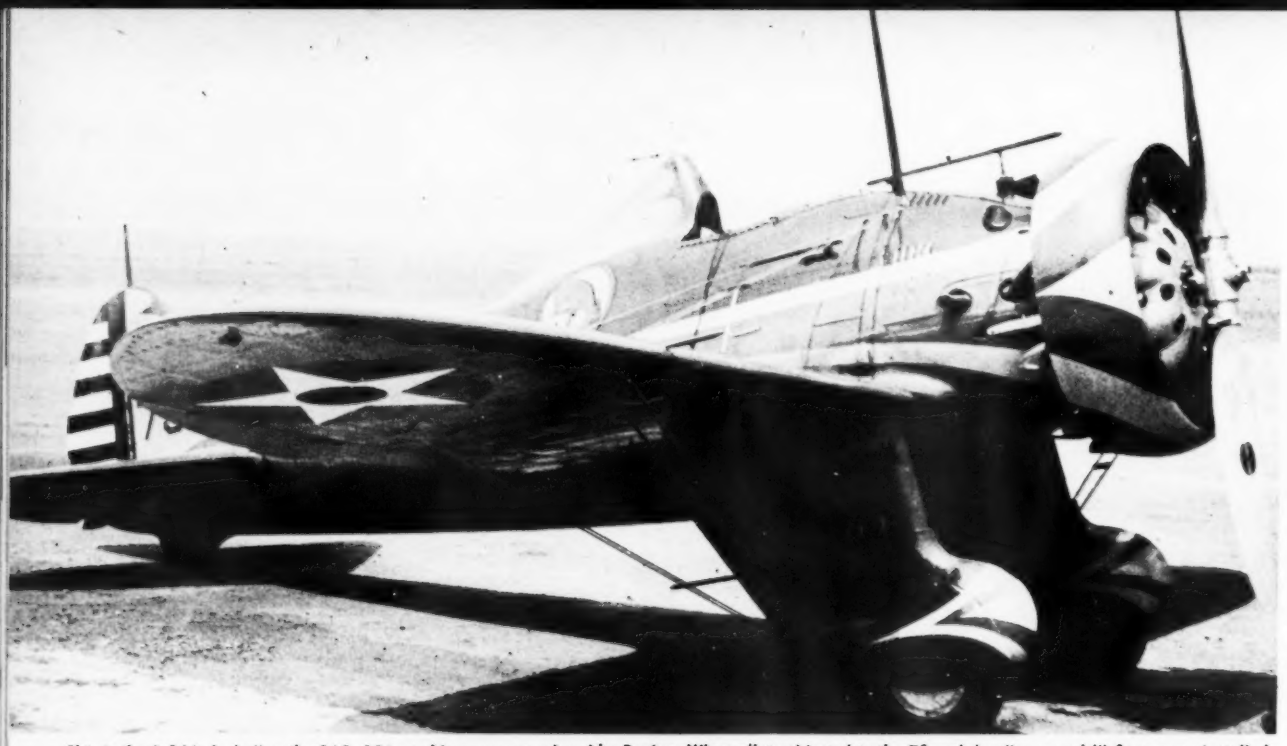
Cut out the four fuselage sides and bulkhead Nos. 2, 3, 4, 5, 6, 7 of 1/16" sheet balsa. Cut out bulkhead No. 1 of 1/16" birch plywood. Note that the two top sides of the fuselage are cut off shorter at the rear; this is shown with dotted lines on the plans. It will be necessary to bevel the fuselage sides so a good, strong, neat cement joint can be obtained. Mark the two bottom sides of the fuselage at the correct positions for the bulkheads and then insert and cement bulkhead Nos. 2, 3, 4, 5, 6, 7, in place. When dry, add the two top sides. Next drill holes through the firewall to suit engine to be used and then cement the nuts to the back of the firewall. Set the bottom of the firewall in 1/8" as noted on the plans for downthrust and cement in place. After the hole has been cut in the side of the fuselage for the *Spitfire* shutoff, the rear of the firewall may be cemented again through this hole. Form the pylon by laminating and cross-graining 1/16" sheet balsa. Make the piece for the pylon a little larger than needed and then trace the pylon from the plans, using carbon paper. Sand pylon and then cement in place. When dry add the wing platform which is made of 3/32" sheet balsa. Cut out and cement sub-rudder in place.

Cut out and cement in place a piece of 1/16" x 3/8" x 1-1/4" plywood for the stab support, then add the rest of the stab platform of 1/16" sheet balsa. Cement two pieces of 1/16" x 3/16" balsa to the top of the wing platform and shape to fit wing airfoil. Cement wing hooks and stab hold-down hook and fuse holder in place. Next, bend the landing gear to shape. Bulkhead No. 1A is then cut out as shown on the plans. It is cut in this manner so that the landing gear can be inserted in the slots and held in place when the motor is mounted. Do not cement bulkhead No. 1A in place until the landing gear has been formed. Use the landing gear as a pattern to get the proper width in the slots when cementing No. 1A in place. Cut hole in side of fuselage for the *Spitfire* shutoff and cement in place.

Cut out seven wing ribs for each half of the wing, noting that the spars are staggered. (*Continued on page* 41)



FULL-SIZE PLANS FOR BOTH "THE BOUNDER" AND "THE ZEPHYR" AVAILABLE. SEE PAGE 52.



This is the P-26A. Including the 26C, 136 machines were produced by Boeing. When pilots objected to the 73 mph landing speed (!) flaps were installed.

FIRST "MODERN" FIGHTER 1

by ROBERT C. HARE

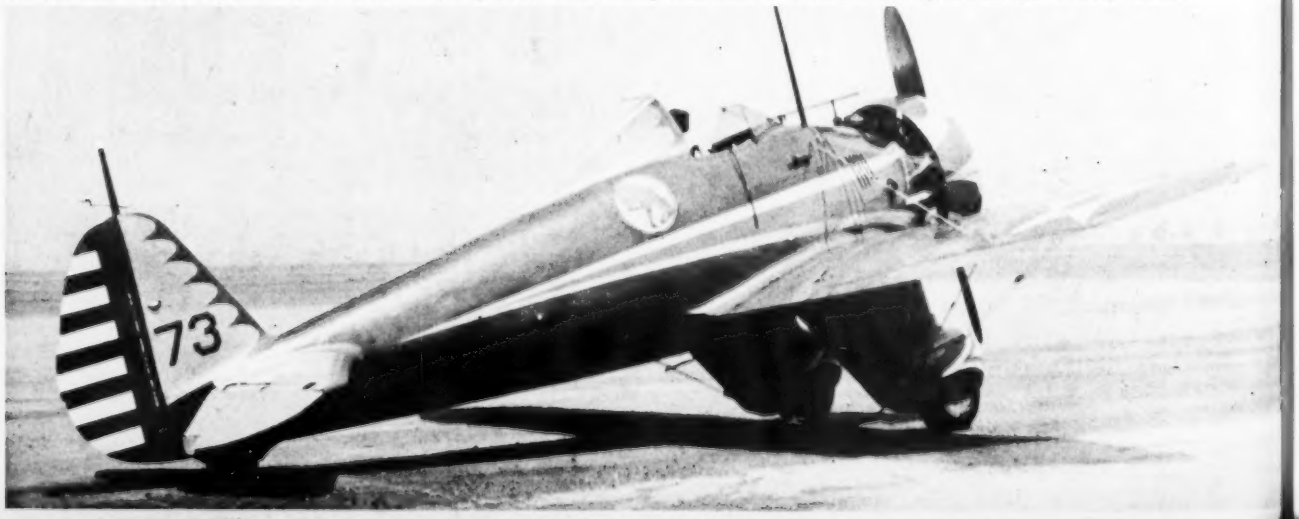
Boeing's P-26 for the Army Air Force was the turning point. The monoplane, all-metal construction, and the air-cooled engine, all were combined in a snappy looking job that cast the shape of things to come.

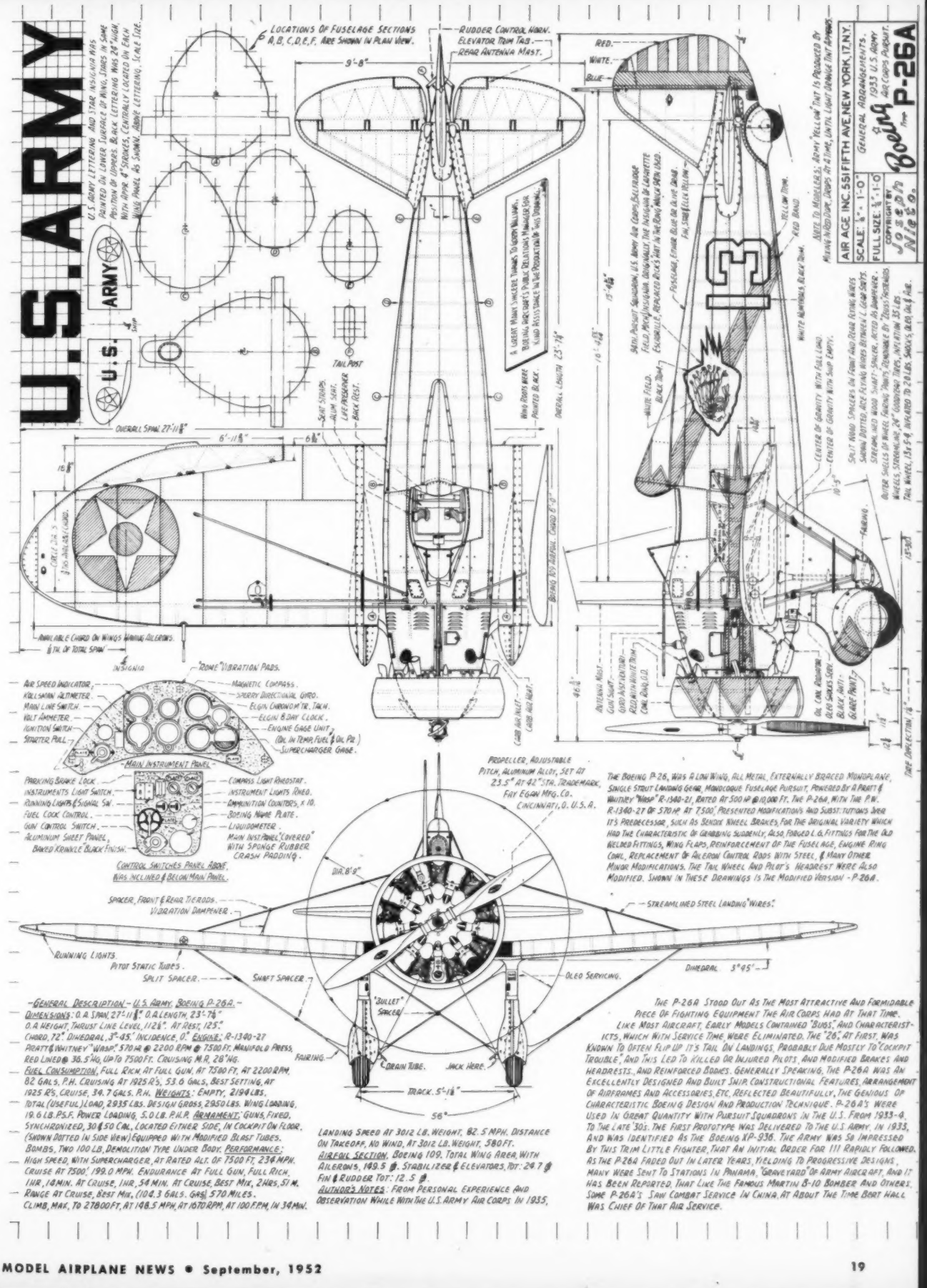
Ten years after World War I, aircraft were made of the same materials, looked about the same, and had about the same performance as those developed in the early Twenties. They were good airplanes, but the industry seemed to be right on the edge of a new epoch, so to speak.

Several advances had taken place during that period, that were destined to give aviation the boost it so badly needed. One was the beginning of the switch from biplane to monoplane configurations, another was the development of the radial air-cooled engine; the all-metal airplane was on its way, too.

Great controversies raged on the air-cooled or liquid-cooled engine question. Then, in 1927, Lindbergh proved the reliability of the air-cooled engine, and he used a Ryan monoplane to do it. The liquid-cooled faction pointed to the resistance offered by a radial engine. National Advisory Committee for Aeronautics experimented with and developed the N.A.C.A. cowl. Almost simultaneously came the Townend and other "speed rings" for the air-cooled proponents. The Ford *Trimotor* proved metal to be a practical (*Continued on page* 46)

Concept of P-26 series traces back to the Travel Air *Mystery Ship*, history making racer which is reported to have opened the eyes of Army "wheels."




U.S.ARMY
U.S. ARMY LETTERING AND STAR INSIGNIA WAS PAINTED ON LOWER SURFACE OF WING. STARS IN SAME POSITION ON UPPER. BLACK LETTERING WAS 24" HIGH WITH AFT 4" SERIFES, CENTERED LOCATED ON EACH WING PANEL AS SHOWN. ABOVE LETTERING, SCALE SIZE.
LOCATIONS OF FUSELAGE SECTIONS A, B, C, D, E, F, ARE SHOWN IN PLAN VIEW.
RUDDER CONTROL HORN.
ELEVATOR TRIM TAB.
REAR ANTENNA MAST.
RED.
WHITE.
BLUE.
AIR AGE INC. 551 FIFTH AVE. NEW YORK, 17, N.Y.
SCALE: 1/8" - 1'-0"
FULL SIZE: 3/4"-1-0
COPYRIGHT BY JOSEPH NIEDO.
GENERAL ARRANGEMENTS. 1935 U.S. ARMY AIR CORPS PURSUIT.
Boeing Type P-26A
NOTE TO MODELERS: ARMY "YELLOW" THAT IS PRODUCED BY MIXING NITROTOLUOL DROPS AT A TIME, UNTIL LIGHT ORANGE THAT APPEARS
A LARGE MANY SINCERE THANKS TO KEITH WILLIAMS, BOEING AIRCRAFT'S PUBLIC RELATIONS MANAGER FOR HIS ASSISTANCE IN THE PRODUCTION OF THIS DRAWING.
WING PARTS WERE PAINTED BLACK.
TAIL POST
SEAT STRAPS
ALUM SEAT.
LIFE PRESERVER BACK REST.
OVERALL SPAN 27'-11 3/8"
6'-11 3/8"
6 1/8"
15 1/8"
CHORD 24" 3 1/16 AREA CHORD.
AVAILABLE CHORD ON WINGS WHERE AILERONS 1/4TH OF TOTAL SPAN
9'-8"
OVERALL LENGTH 23'-7 1/4"
BOEING 109 AIRFOIL CHORD 5'-3"
CABIN AIR INLET
CABIN AIR HEAT.
SEMI-PURSUIT SQUADRON, U.S. ARMY AIR CORPS, SELFRIDGE FIELD, MICHIGAN. ORIGINALLY, THE INSIGNIA OF LAFAYETTE ESCADRILLE, REPLACED BUCK'S HAT IN WHICH WAS SEEN USED.
FUSELAGE, ENTIRE BLUE OR OLIVE DRAB.
TAIL SURFACES YELLOW.
WHITE FIELD.
BLACK TRIM
YELLOW TRIM.
RED BAND
WHITE NUMERALS, BLACK TRIM.
CENTER OF GRAVITY WITH FULL LOAD.
CENTER OF GRAVITY WITH SHIP EMPTY.
SPLIT WIND SPACERS ON FRONT AND REAR RETRACTING WIRES SHOWN DOTTED ARE FLYING WIRES BETWEEN L.G. LEGS STRUTS.
STREAMLINED WOOD STRUT SPACER. ACTED AS DAMPENER.
OUTER SHELLS OF WHEEL FAIRING PANTS REMOVABLE BY CROSS HEADED SCREWS. WHEELS, STANDARD, 24" GOODYEAR TIRES, INFLATION 35 LBS. TAIL WHEEL, 13 x 5-8, INFLATED TO 20 LBS. SHOCKS, OLEO ONLY AIR.
TAPE DEFLECTION 1/8"
INSIGNIA
"DOME" VIBRATION PADS.
AIR SPEED INDICATOR.
KOLLSMAN ALTIMETER.
MAIN LINE SWITCH.
VOLT AMMETER.
IGNITION SWITCH.
STARTER PULL.
MAGNETIC COMPASS.
SPERRY DIRECTIONAL GYRO.
ELGIN CHRONOM TR. TACH.
ELGIN 8 DAY CLOCK.
ENGINE GAGE UNIT (OIL IN TEMP, FUEL & OIL PR.)
SUPERCHARGER GAGE.
MAIN INSTRUMENT PANEL
PARKING BRAKE LOCK.
INSTRUMENTS LIGHT SWITCH.
RUNNING LIGHTS & SIGNAL SW.
FUEL COCK CONTROL.
GUN CONTROL SWITCH.
ALUMINUM SHEET PANEL, BAKED KRINKLE BLACK FINISH.
COMPASS LIGHT RHEOSTAT.
INSTRUMENT LIGHTS RHEO.
AMMUNITION COUNTERS, X 10.
BOEING NAME PLATE.
LIQUIDOMETER.
MAIN INSTPANEL "COVERED" WITH SPONGE RUBBER CRASH PADDING.
CONTROL SWITCHES PANEL ABOVE WAS INCLINED & BELOW MAIN PANEL.
PROPELLER, ADJUSTABLE PITCH, ALUMINUM ALLOY, SET AT 23.5° AT 42" STA. TRADEMARK, FAY EGAN MFG. CO. CINCINNATI, O. U.S.A.
DIA. 8'9"
SPACER, FRONT & REAR TIERODS. VIBRATION DAMPENER.
STREAMLINED STEEL LANDING WIRES.
RUNNING LIGHTS.
PITOT STATIC TUBES.
SPLIT SPACER.
SHAFT SPACER
DIHEDRAL 3°45'
OLEO SERVICING.
"BULLET" SPACER
FAIRING
DRAIN TUBE.
JACK HERE.
TRACK 5'-1 1/8"
56"
INTERNAL MIST
GUN SHAFT
GYRO ASSISTENTOR
RELOCATION MINUTE TRIM
CONE RING O.D.
OIL CONE ATTACHING
OLEO SHOCK STRT.
BLAST ANTI-BLAST PAINT

THE BOEING P-26, WAS A LOW WING, ALL METAL, EXTERNALLY BRACED MONOPLANE, SINGLE STRUT LANDING GEAR, MONOCOQUE FUSELAGE PURSUIT, POWERED BY A PRATT & WHITNEY "WASP" R-1340-21, RATED AT 500 HP @ 10,000 FT. THE P-26A, WITH THE P.W. R-1340-27 OF 570 HP. AT 7,500', PRESENTED MODIFICATIONS AND SUBSTITUTIONS OVER IT'S PREDECESSOR, SUCH AS SERVICE WHEEL BRAKES, FOR THE ORIGINAL VARIETY WHICH HAD THE CHARACTERISTIC OF GRABBING SUDDENLY, ALSO, FORGED L.G. FITTINGS FOR THE OLD WELDED FITTINGS, WING FLAPS, REINFORCEMENT OF THE FUSELAGE, ENGINE RING COWL, REPLACEMENT OF AILERON CONTROL RODS WITH STEEL, & MANY OTHER MINOR MODIFICATIONS. THE TAIL WHEEL AND PILOT'S HEADREST WERE ALSO MODIFIED. SHOWN IN THESE DRAWINGS IS THE MODIFIED VERSION - P-26A.

-GENERAL DESCRIPTION- U.S. ARMY, BOEING P-26A.- DIMENSIONS: O.A. SPAN, 27'-11 3/8". O.A. LENGTH, 23'-7 1/4". O.A. HEIGHT, THRUST LINE LEVEL, 11'2 1/4". AT REST, 12'5". CHORD, 72". DIHEDRAL, 3°-45'. INCIDENCE, 0°. ENGINE: R-1340-27 PRATT & WHITNEY "WASP", 570 HP @ 2200 RPM @ 7500 FT. MANIFOLD PRESS, RED LINED @ 36.5" HG, UP TO 7500 FT. CRUISING M.P. 28" HG. FUEL CONSUMPTION, FULL RICH, AT FULL GUN, AT 7500 FT, AT 2200 RPM, 82 GALS, P.H. CRUISING AT 1925 R'S, 53.6 GALS, BEST SETTING, AT 1925 R'S, CRUISE, 34.7 GALS. P.H. WEIGHTS: EMPTY, 2190 LBS. TOTAL (USEFUL) LOAD, 2935 LBS. DESIGN GROSS, 2950 LBS. WING LOADING, 19.6 LB. P.S.F. POWER LOADING, 5.0 LB. P.H.P. ARMAMENT: GUNS, FIXED, SYNCHRONIZED, 30 & 50 CAL., LOCATED EITHER SIDE, IN COCKPIT ON FLOOR. (SHOWN DOTTED IN SIDE VIEW) EQUIPPED WITH MODIFIED BLAST TUBES. BOMBS, TWO 100 LB. DEMOLITION TYPE UNDER BODY. PERFORMANCE: HIGH SPEED, WITH SUPERCHARGER, AT RATED ALT. OF 7500 FT, 234 MPH. CRUISE AT 7500', 199.0 MPH. ENDURANCE AT FULL GUN, FULL RICH, 1 HR., 14 MIN. AT CRUISE, 1 HR., 54 MIN. AT CRUISE, BEST MIX, 2 HRS, 51 M. RANGE AT CRUISE, BEST MIX, (104.3 GALS. GAS) 570 MILES. CLIMB, MAX, TO 27800 FT, AT 148.5 MPH, AT 1670 RPM, AT 100 F.P.M. IN 34 MIN.

LANDING SPEED AT 3012 LB. WEIGHT, 82.5 MPH. DISTANCE ON TAKEOFF, NO WIND, AT 3012 LB. WEIGHT, 580 FT. AIRFOIL SECTION, BOEING 109. TOTAL WING AREA, WITH AILERONS, 149.5 ☐. STABILIZER & ELEVATORS, TOT.: 24.7 ☐ FIN & RUDDER TOT: 12.5 ☐. AUTHOR'S NOTES: FROM PERSONAL EXPERIENCE AND OBSERVATION WHILE WITH THE U.S. ARMY AIR CORPS IN 1935,

THE P-26A STOOD OUT AS THE MOST ATTRACTIVE AND FORMIDABLE PIECE OF FIGHTING EQUIPMENT THE AIR CORPS HAD AT THAT TIME. LIKE MOST AIRCRAFT, EARLY MODELS CONTAINED "BUGS," AND CHARACTERISTICS, WHICH WITH SERVICE TIME WERE ELIMINATED. THE "26", AT FIRST, WAS KNOWN TO OFTEN FLIP UP IT'S TAIL ON LANDINGS, PROBABLY DUE MOSTLY TO "COCKPIT TROUBLE", AND THIS LED TO KILLED OR INJURED PILOTS, AND MODIFIED BRAKES AND HEADRESTS, AND REINFORCED BODIES. GENERALLY SPEAKING, THE P-26A WAS AN EXCELLENTLY DESIGNED AND BUILT SHIP. CONSTRUCTIONAL FEATURES, ARRANGEMENT OF AIRFRAMES AND ACCESSORIES, ETC, REFLECTED BEAUTIFULLY, THE GENIOUS OF CHARACTERISTIC BOEING DESIGN AND PRODUCTION TECHNIQUE. P-26A'S WERE USED IN GREAT QUANTITY WITH PURSUIT SQUADRONS IN THE U.S. FROM 1933-4. TO THE LATE '30'S. THE FIRST PROTOTYPE WAS DELIVERED TO THE U.S. ARMY, IN 1933, AND WAS IDENTIFIED AS THE BOEING XP-936. THE ARMY WAS SO IMPRESSED BY THIS TRIM LITTLE FIGHTER, THAT AN INITIAL ORDER FOR 111 RAPIDLY FOLLOWED. AS THE P-26A FADED OUT IN LATER YEARS, YIELDING TO PROGRESSIVE DESIGNS, MANY WERE SENT TO STATIONS IN PANAMA, "GRAVEYARD" OF ARMY AIRCRAFT, AND IT HAS BEEN REPORTED, THAT LIKE THE FAMOUS MARTIN B-10 BOMBER AND OTHERS, SOME P-26A'S SAW COMBAT SERVICE IN CHINA, AT ABOUT THE TIME BEAT HALL WAS CHIEF OF THAT AIR SERVICE.

A well proportioned British radio job takes to the air during the West Essex Gala Day, Fairlop Aerodrome, London. The plane was built by O. Hemsley.

TRICKS OF THE TRADE

▼

Ed Lorenz, noted designer of radio equipment for use in model aircraft, concludes a comprehensive discussion to give the new rc'er an idea of what it is all about. In the last issue, he covered transmitters, receivers, actuators, provided a glossary of terms. This month, he discusses tricks of the trade, relays, gives a complete run-down of batteries available, matching them with ship sizes, other requirements.

Norm Rosenstock makes a hand glide test of a radio-controlled tow-liner. An excellent soarer, ship is a development of Jasco design.

To acquaint you with little "tricks of the trade," which may prove helpful to you in radio control work, here are a few useful items.

Figure 1 shows a power supply operating from the 110 volt AC line. This will supply a smooth source of DC power for experimental transmitter and receiver work, thus saving batteries. The money spent in building this unit will be repaid in battery replacement cost within a period of six months, especially if it is a club project. This power supply may be constructed on a small board and covered to protect the user from shock and the power supply from short circuits. Your local radio shop or a "ham" friend should be able to help you build it into a metal box, taking the proper precautions against shorts. Have the output taps checked for the correct voltage, fluctuations being due to variations in line voltage.

Figure 2 shows how a half-wave folded dipole antenna may be constructed to take up less space and be more portable. This configuration will eliminate nulls also. The supports may be made from thin strips of wood.

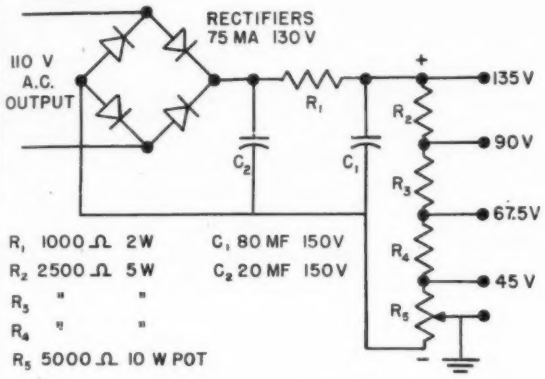
The use of relays makes possible many variations in control circuits while still using a single receiver. While it is admitted that several relays will add a little weight to the receiver contral system, their usage has the advantage of not being an electronic type of control and once adjusted will always hold that adjustment. And then there is only one receiver to tune. To use a relay system requires a pulsing signal from the transmitter. Since this is not a construction article, we shall not go into elaborate systems but shall show the two basic hookups used to accomplish various functions. Figure 3 shows the method used to hold a relay on while pulses are being transmitted, and Figure 4 shows the circuit for keeping the relay open during pulses. The size of the condensers and resistor will vary with the resistance and inductance of the relay and the supply voltage but are representative when using a Kurman 5,000 ohm or Sigma 8,000 or 10,000 ohm relay with a 45-volt supply voltage. This type of relay control system is operated best by running the delay relays off the points of the receiver relay. Experimentally, results may be observed by making the hookups as shown and then rapidly making and breaking the battery lead.

For those interested in a pulse type transmitter control, Figure 5 shows a typical method of construction. This will give a pulse length varying from minimum time on/maximum time off to maximum time on/minimum time off. At midway point, the pulse length, time on and time off, are equal. Pulse rate may be varied by attaching a gear train to the motor shaft to turn the commutator and then placing a 10 or 15 ohm rheostat in series with one of the motor leads.

For a club project, a simple field strength meter is shown in Figure 6. This instrument may be used to determine correct antenna coupling on the transmitter, radiation patterns of transmitting antennas, and relative signal outputs of various transmitter circuits. It is basically a receiver which indicates relative signal strength. In operation, the field strength meter is taken about 50 to 500 feet from the transmitter and meter readings noted when tuned to the correct frequency. This will be indicated as an increase on the meter. When adjusting antenna coupling or tying various antennas, the meter should be located at the same spot and in the same position each time so as to get accurate comparative readings. Removing one's hand from the tuning condenser or tuning wand may detune it slightly; if this happens, the capacity setting should be increased SLIGHTLY, then moved back, and increase in reading observed.

TRICKS

FIG. 1



R1 1000 Ω 2W C1 80 MF 150V
R2 2500 Ω 5W C2 20 MF 150V
R3 " "
R4 " "
R5 5000 Ω 10 W POT

FIG. 2

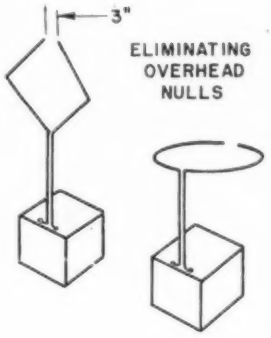
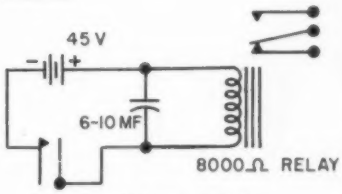
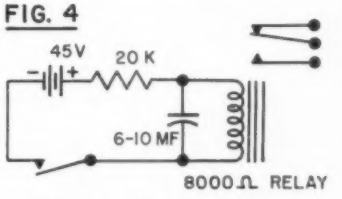


FIG. 3



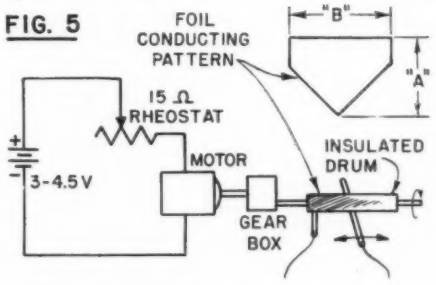
8000 Ω RELAY OPEN
WHILE RECEIVING PULSES

FIG. 4



8000 Ω RELAY CLOSED
WHILE RECEIVING PULSES.

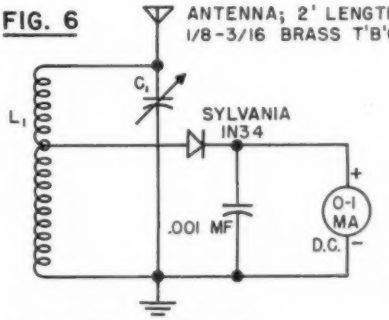
FIG. 5



USE WIRE WOUND RHEOSTAT OR POT,
CLAROSTAT 58-15

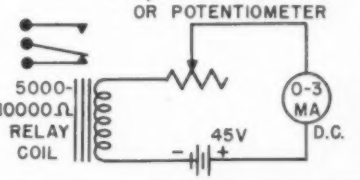
"A" = 1/2" LESS THAN LENGTH OF DRUM
"B" = CIRCUMFERENCE OF DRUM

FIG. 6



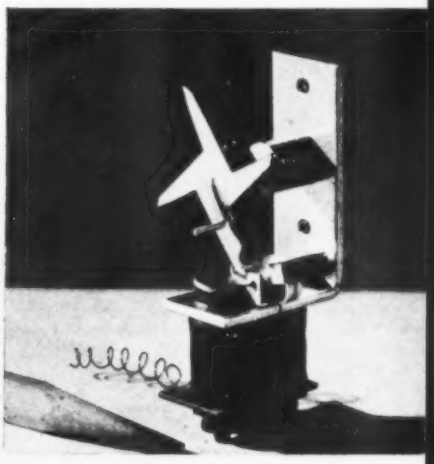
C1 50 MMF AIR TRIMMER
L1 7 TURNS 14 WIRE 3/4" I.D. X 1"
LONG, TAPPED 2 TURNS FROM TOP

FIG. 7

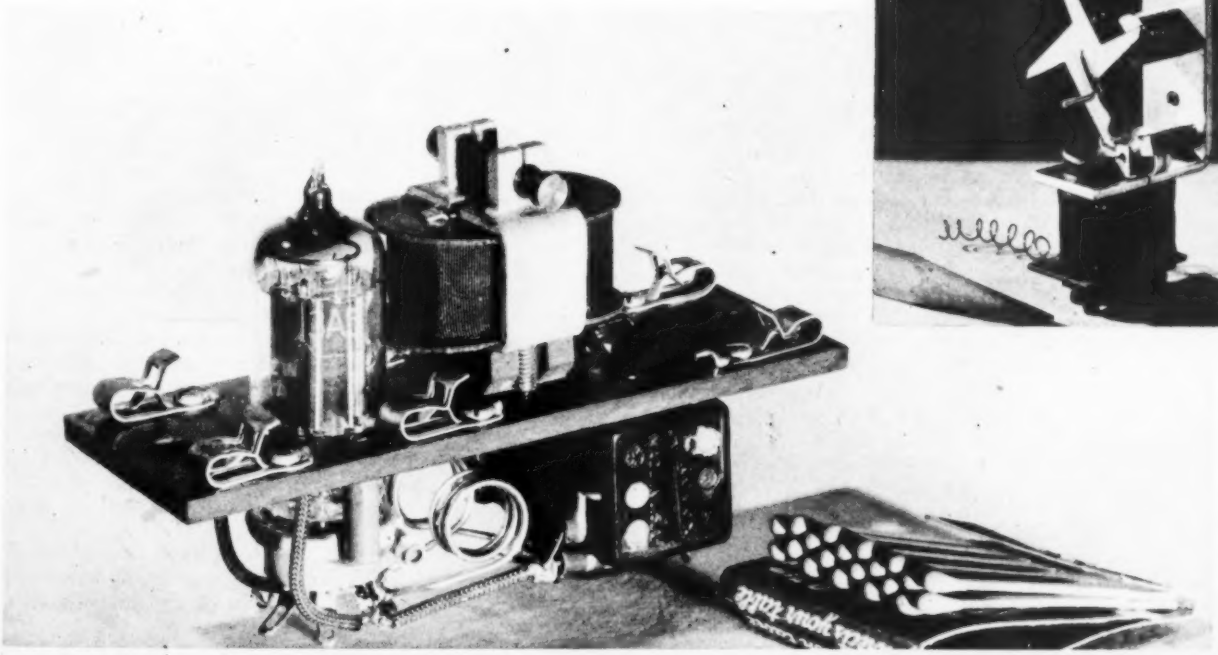


SET POT TO MAXIMUM RESISTANCE
BEFORE HOOKING UP.

Right—The Good Brothers four-position escapement. Note the double magnets. When used with a beep box, this type of escapement has proved capable of following up to 20 impulses a second.



Below—Good Brothers receiver is an example of a hard-tube circuit. Relay, adjacent to tube, is specially made, may seem strange to builders who are familiar with the Sigmas and Kurmans.



One of Walker's earlier jobs buzzes camera. Walker has been working for years to perfect for public consumption an advanced multi-control "brain."

BATTERIES

▶ The best designed equipment in the world will not operate properly without the correct and proper power supply. Batteries are an essential item in a radio control circuit but very little information has been written on the subject.

The chart on the next page gives the recommended batteries available at all hearing aid suppliers and radio shops. One of the primary things to keep in mind when designing a model and/or radio unit is to use standard and available batteries. Nothing is more exasperating when out flying than to have batteries go dead and then not be able to replace them readily. This is especially true of filament and escapement batteries. Plug-in batteries are convenient but regular flashlight cells are available in almost every store at any time.

The performance of receivers is largely dependent upon the proper voltage. In a transmitter, the loss of voltage will result in a lower output and perhaps cause a slight change in frequency. The type of superregenerative receivers in use today is fairly critical of improper voltages. Ordinarily, battery charts give battery life based on an end point voltage of as low as .8 volts per cell. This means that the "B" supply, which is a 45 volt battery composed of thirty 1-1/2 volt cells, will be shown as having a life, based on an end point voltage, of about 32 or 34 volts. This is definitely too low a voltage for operation of a radio control receiver. The only way correct operation can be assured is to check the batteries occasionally with a good voltmeter. MAKE SURE THE METER IS ACCURATE. A poor or cheap meter will give inaccurate readings and often can prove to be worse than no meter at all. However, an inexpensive meter should not be discarded because of the preceding sentence. Have it checked at your local radio or television service shop, using a good 45 volt (or appropriate voltage for your meter) battery as a standard. Recalibrate the face of your meter to correspond to the correct value.

The "A" supply should not be allowed to fall below 1.2 volts for reliable operation. ALWAYS attempt to check the batteries being tested under load; that is, under actual circuit operating conditions. As a cell grows older, its internal resistance increases due to polarization. This gives a false reading if the battery is tested with no load, with the reading possibly being normal. When any current is drawn from the battery, the voltage immediately will drop and consequently, the current, resulting in reduced power availability. Thus when a battery, which has been used a great deal or has had a long shelf life, is tested under actual circuit conditions, the voltage will be less than the stated voltage on the battery. How much below will depend on the run-down condition of the battery and the amount of current being consumed.

The "B" supply should not be allowed to fall below 41 volts when using the RK-61 or XFG-1, nor below 38 volts on high vacuum tube type receivers. Again, be sure to check voltages when batteries have the load applied.

One of the facts to be remembered when doing winter or cold weather flying, is that the capacity of the batteries decreases with temperature. The ideal temperature for maximum life, consistent with a nominal current drain, is 70 degrees F. With a decrease of temperature, the power output of the cell or cells decreases until very low temperatures may render them useless for the purpose. At temperatures around 20 degrees F. to zero, the output may drop as much as 40 to 60 per cent. On the other hand, an increased temperature will raise the power output of cells temporarily. At temperatures around 90 degrees to 110 degrees F., the output may be boosted about 10 to 15 per cent. If used batteries are heated to about 100 degrees F., the life may be increased temporarily. We say temporarily because at such elevated temperatures, the chemical action of a dry cell is forced, and upon returning to 70 degrees F., the output will be lower than normal.

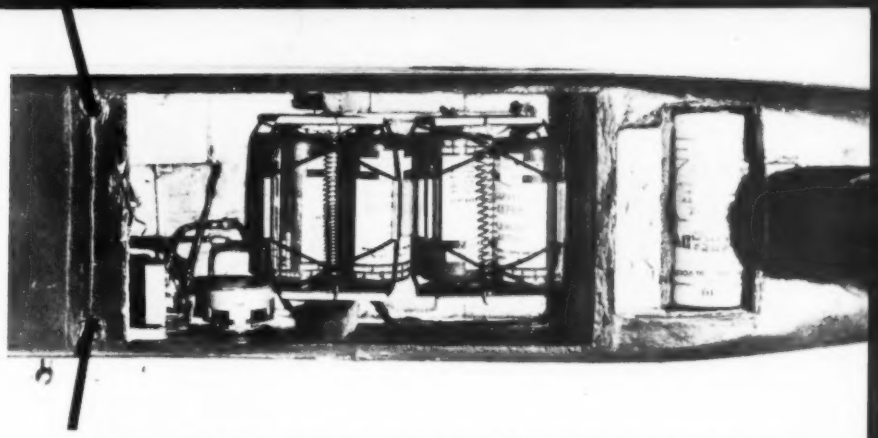
In view of this, the best place to store batteries, especially the small 22-1/2 size, until used, is in your refrigerator. They should not be allowed to become frozen but should be placed where the temperature is between 35 and 50 degrees F. The author recommends buying the receiver batteries (22-1/2 and 45 volts) at hearing aid supply stores. Because of turnover in sales, the batteries are fresher.

An article entitled "Save that Battery" by Herb Owbridge in the March 1949 issue of M. A. N. gives construction and operation details on dry cell battery charging. Well worth reading. You will find that many of your modeler friends have back issues from year to year so that early issues mentioned should not be difficult to locate.

The small mercury type cells, commonly used for hearing filament supply, are not generally suitable for radio control use because of the relatively low current drain per weight. These cells are made in various sizes, the general appearance being a thick disc shape. The initial voltage on these cells is 1.38 volts and, if the current drain is kept low from 40 to 120ma, depending upon the size of the cell, the life is quite long compared to regular carbon zinc cells. However, the cells are about three times as heavy as standard cells on a volume basis. The cost, on an average, is about three to four times that of a small carbon zinc cell.

Wet cells are acceptable for filament and actuator use. If used for filament supply, a dropping resistor will have to be employed to reduce the voltage from 2.1 volts to 1.4 volts.

Batteries cannot be taken for granted. There's the question of size for one thing, type for another. And they are the one factor that requires constant checking. Some tips on battery selection, care, meters, life.



Typically good battery installation showing the 1-1/2-volt A's, the 45-volt B's, three-volt escapement batteries. Batteries should be checked underload before every flying session.

Due to their high current capacity, they are excellent for actuator use. Perhaps the main drawback is that they must be kept charged at all times in order to maintain their efficiency. This often is a disadvantage when out in the field and a battery goes dead. Venner Accumulators Ltd., of England, manufactures a small wet type cell that requires only a few drops of water to put it in operating condition and is capable of being short circuited without danger to the cell. Control Research of Hampton, Virginia, can furnish information on these cells.

Use fresh batteries and clean good connections and be assured of improved performance. Do not use batteries that are too small merely to save weight. It is better to plan on a little extra weight than to have batteries fail prematurely. With reference to the battery chart, those marked * should be used only on AA models where weight and space are of primary importance. The "A" cell can be expected to give about 15 to 20 minutes of continuous life if used with an RK-61 or XFG-1 and the 22-1/2 volt "B" batteries (two used in series for 45 volts) about 5 to 20 hours use, depending on the plate current of the tube.

We suggest the following batteries for the various classes of planes:

Class AA

A Cell	*B Battery*
Eveready 912	Olin 0815
Burgess 7	Eveready 412
	Burgess U15E

Class A

Eveready 915	Eveready 412
Burgess "Z"	Burgess U15E

Class B

Eveready 935	Eveready 420
Burgess "C"	Burgess K15E
Burgess TE	

Class C

Eveready "D"	Eveready 455
Burgess 2R	Burgess XX30
Burgess TE	

Below — Save this battery chart! Everything you need to know is listed right down the line.

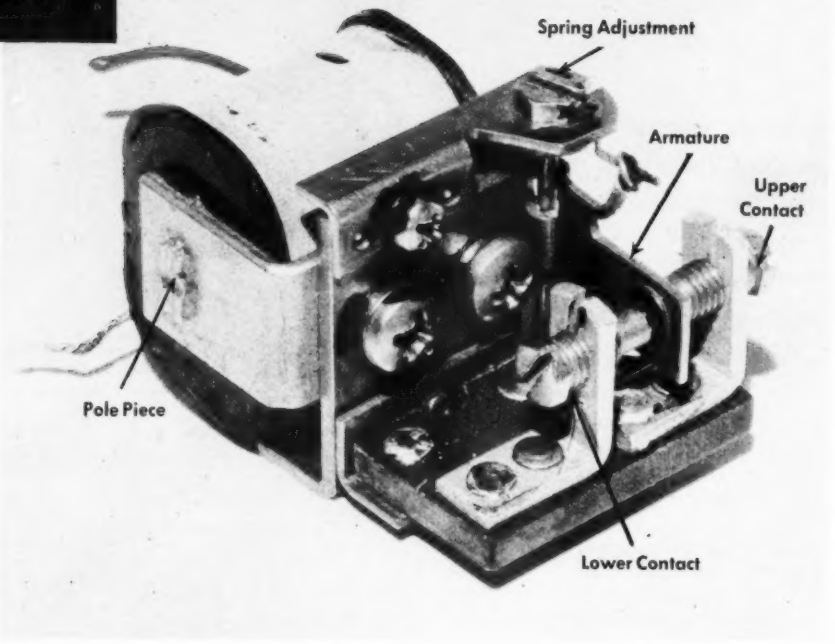
R.C. BATTERY DATA

USE	VOLTAGE	SIZE	TYPE OF CONNECTION	MFGR AND NUMBER	WEIGHT	EQUIVALENT
TRANSMITTERS	1½	2 5/8 X 2 3/8 X 4 3/32	PLUG 2744	BURGESS 4F		EVEREADY 742
	1½	4 7/8 X 1 3/8 X 5 9/16	PLUG 2744	BURGESS 4FL		
	1½	4 3/32 X 2 3/4 X 4 1/16	PLUG 2744	BURGESS 6F		
	6	2 21/32 X 2 21/32 X 4 1/8	PLUG 2795	BURGESS F4PI		
	6	4 X 1 1/8 X 10 3/4	PLUG 2795	BURGESS 2F4L		
	45	3 5/16 X 2 1/4 X 4 5/16	PLUG 273	BURGESS B30		
	45	3 X 2 5/16 X 4 1/16	PLUG 273	BURGESS Z30		
	67½	2 3/4 X 1 11/32 X 3 11/16	SNAPS	BURGESS XX30		EVEREADY 467
	90	3 11/16 X 1 9/32 X 3 19/32	SNAPS	BURGESS N60		EVEREADY 490
RECEIVERS	1½	3/8 DIA. X 1 3/4	BRASS CAP	(1) BURGESS 7	.2 OZ.	EVEREADY 912
	1½	17/32 DIA. X 1 31/32	BRASS CAP	(2) BURGESS Z	.5 OZ.	EVEREADY 915
	1½	15/16 DIA. X 1 15/16	BRASS CAP	(3) BURGESS 1	1.5 OZ.	EVEREADY 935
	1½	1¼ DIA. X 2 7/16	BRASS CAP	(4) BURGESS 2R	3.2 OZ.	
	1½	3/4 DIA. X 2 7/32	BRASS CAP	BURGESS 5ES	1.2 OZ.	
	1½	1 3/32 DIA. X 3 15/16	PLUG 2744	BURGESS TE	4 OZ.	
	22½	19/32 X 19/32 X 1 19/16	BRASS CAP	(1) OLIN 0815	.5 OZ.	
	22½	1 31/32 X 9/16 X 31/32	FLAT BRASS	BURGESS U15E	1 OZ.	EVEREADY 412
	22½	7/8 X 1 1/4 X 2 9/32	FLAT BRASS	BURGESS K15E	2.25 OZ.	EVEREADY 420
	45	2 17/32 X 31/32 X 4 1/32	SOCKET	BURGESS XX30E	8.75 OZ.	
	45	2 17/32 X 31/32 X 3 21/32	SNAPS	BURGESS XX30	8.5 OZ.	EVEREADY 912
ACTUATORS	1½	17/32 DIA. X 1 31/32	BRASS CAP	BURGESS Z	.5 OZ.	EVEREADY 915
	1½	15/16 DIA. X 1 15/16	BRASS CAP	BURGESS 1	1.5 OZ.	EVEREADY 935
	3	1 3/16 X 1 3/16 X 2 13/32	PLUG	BURGESS 2Z2PI	3.3 OZ.	

OTHER MANUFACTURERS GIVE EQUIVALENT TYPE SIZES IN CASE BURGESS BATTERIES ARE NOT AVAILABLE. BATTERY LIFE IS NOT GIVEN DUE TO WIDELY VARIED USE THEY ARE SUBJECTED TO. ALL BATTERIES LISTED EXCEPT BURGESS 7 AND OLIN 0815 HAVE BEEN BENCH AND FLIGHT TESTED AND WILL GIVE ADEQUATE SERVICE PER WEIGHT.

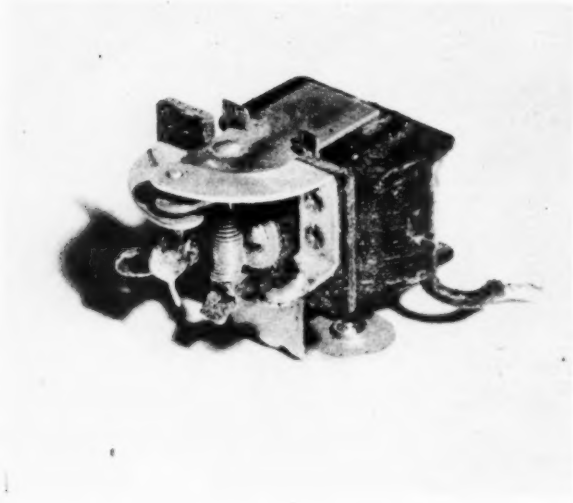
(1) RECOMMENDED ONLY WHEN WEIGHT AND SPACE ARE PRIME FACTORS.
(2) "PENCELL"
(3) "C" SIZE BATTERY
(4) "D" SIZE BATTERY

WENNERSTROM



The Sigma 4F, 8,000 ohm relay. The adjustable screw contacts and slotted head on the spring tension screw, make for reliable operation and easier adjusting. Relays must be set accurately — and no fooling about this!

Below—The Kurman 5,000 ohm relay. Lighter and cheaper, its adjustments are made by contact tabs, bending spring attachment tab. Always keep the live wire contact clean.



RELAYS

The relay and its adjustment play a vital part in your operations. The way it is set determines how much radio range you really can obtain.

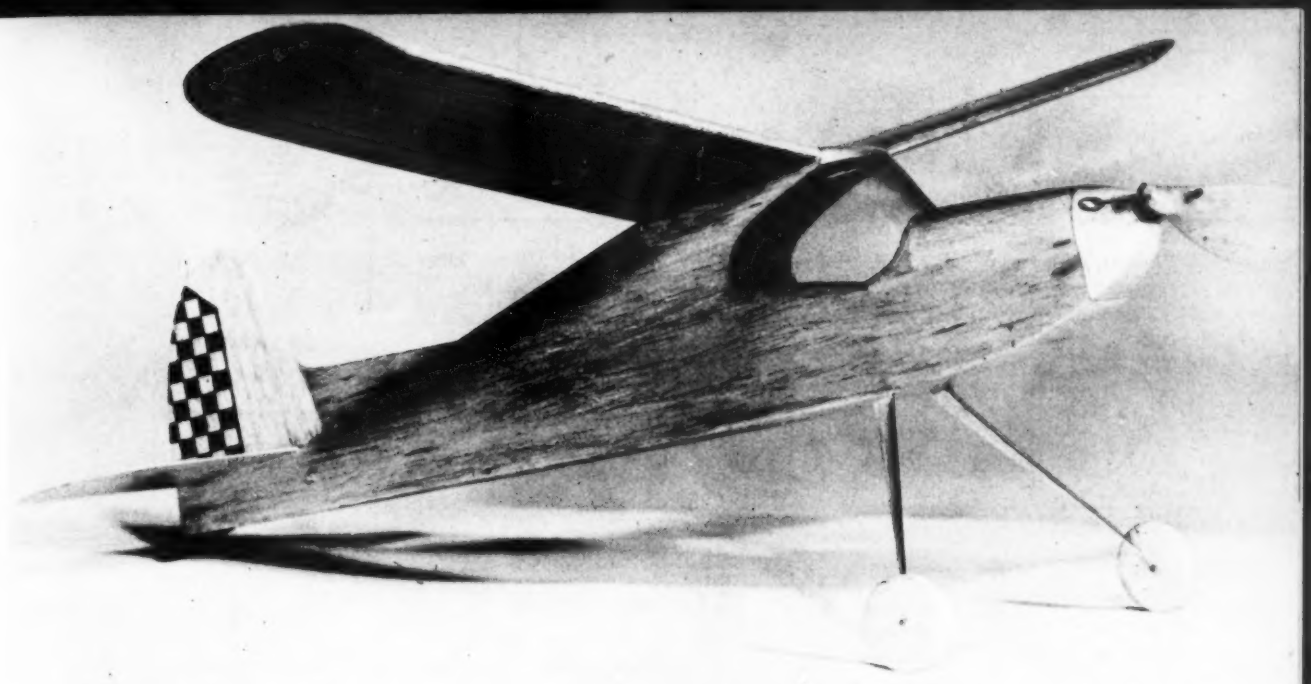
▶ In a radio control receiver the first step out of the radio and into the mechanical is the relay. (The picture, top right, shows the various parts of a relay.)

A properly adjusted and cared for relay will maintain its adjustment and give excellent service. There are two current values to contend with in all relays. This is especially true on sensitive relays, since the current differential is very small. The initial current which flows through the relay, and in which we are first interested, is the pull-on current. This is the amount of current needed, usually about one miliampere, to produce a flux density sufficient to overcome the spring tension on the armature and attract it towards the pole piece. Once the armature is thus attracted, a few more tenths of a miliampere of current will reliably hold it against vibration and insure good contact pressure. When there is a decrease in the current flowing through the coil, the armature will release. This is known as the drop-out current and is less than the pull-on current because the flux density of the coil must fall below that needed to attract the armature. It also is due to a "closer" magnetic circuit's now being in force; that is, the distance between the armature and pole piece is less when the relay is picked up than before the armature is attracted.

The Aerotrol receiver and some of Control Research's use the Kurman 13C44 relay which is a sensitive and lightweight relay. It will operate on a pull-on current of 1.1ma and a drop-out of .6ma. The main objection to it is the method of adjustment, which must be done by the bending of small tabs. The principal assets are its weight of 1-1/4 ounce, and good sensitivity with moderate contact pressure.

The Sigma relay is one of the best relays on the market for radio control. The Sigma type 4F weighs 2-1/4 ounces and all adjustments are by screws, including a screw-adjusted hairspring for tension on the armature. The Sigma type 5F relay, weighing 3-1/4 ounces, gives very reliable operation with a maximum current of 1ma and a drop-out current of .7ma, and is perhaps the best relay to be had. As with any relay, the correct adjustment is essential for proper operation. The clearances for reliable operation of a Sigma relay were illustrated in the first section of this review in the August issue. Sigma Instruments, Inc. has advised us that they are unable to handle individual orders for relays, due to the heavy pressure of defense orders. They also advise that orders will be filled by Terminal Radio Supplies, 85 Cortlandt Street, New York City.

A simple way of setting the relay is as follows: connect relay (Fig. 7, Tricks of the Trade), set rheostat to maximum resistance, which will drop the relay current for an 8,000 ohm Sigma relay to about .3ma. Adjust (*Continued on page* 43)

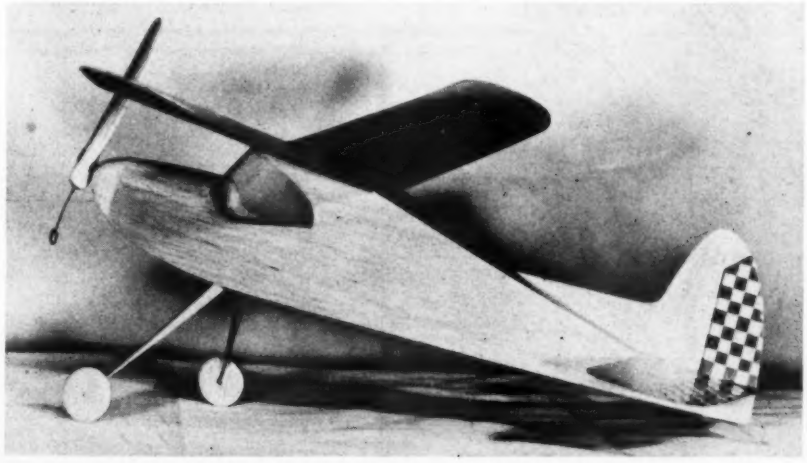


Sandpaper artists will polish off this one! Scaled up, the Skyscooter would make a good almost-anything model. Sport free flight, and maybe an r.c.

Skyscooter

by LLOYD V. HUNT

Have you made a rubber job lately? For shame! For the expert who would sharpen his eye the lazy way, for the beginner who wants a cheap model that really flies, this nifty all-balsa sport job is prescribed. It is durn near prefabbed, as you see.



This job rates high in anybody's book. Folder does not have to be used; a machine cut prop can be finished for good performance. Or hardwood finished prop. Use winder for long flights.

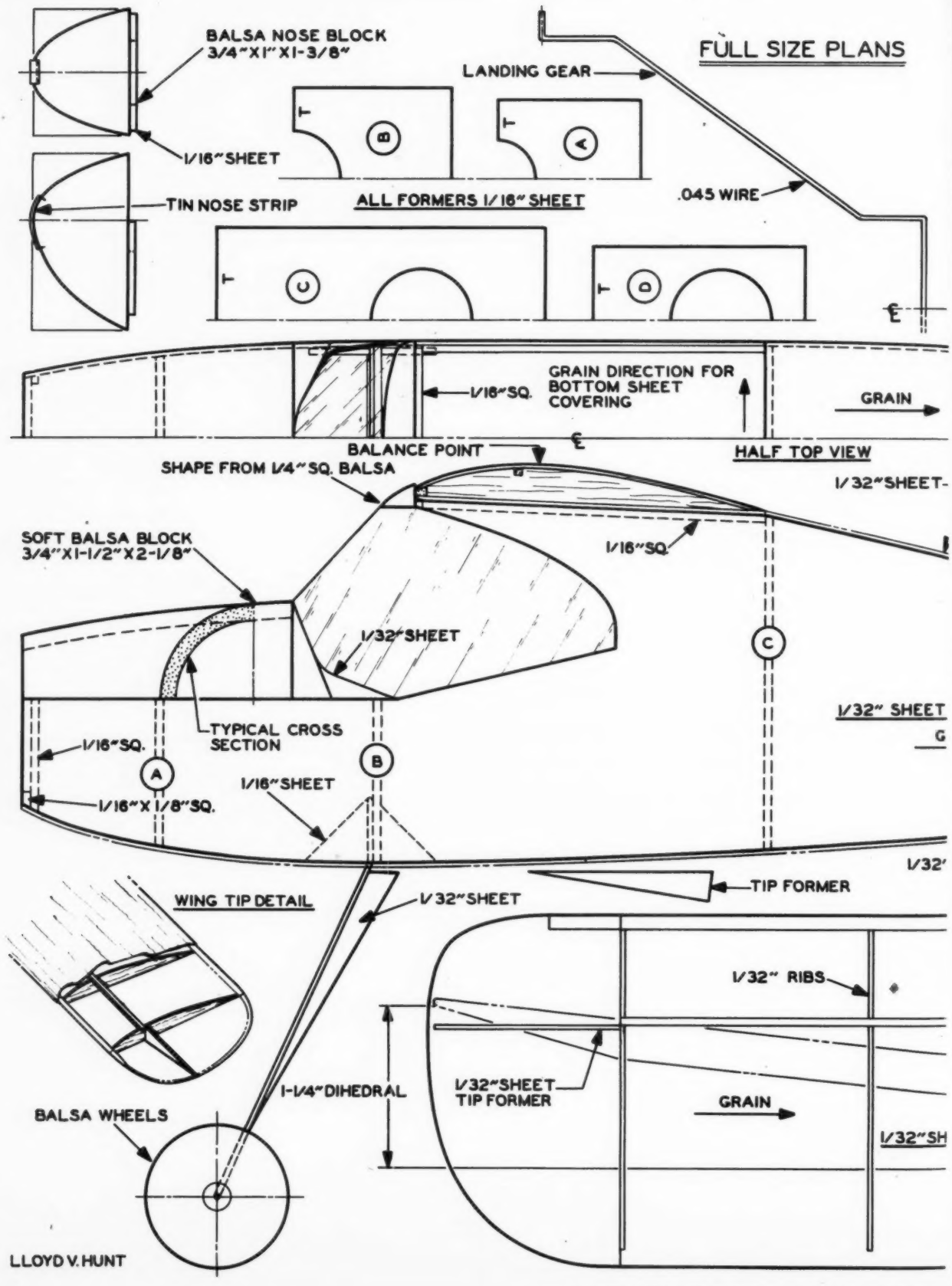
▶ The *Skyscooter* was designed to be powered with one of the small CO_2 engines or with rubber, the latter being illustrated as follows due to the apparent lack of interest in CO_2 flying.

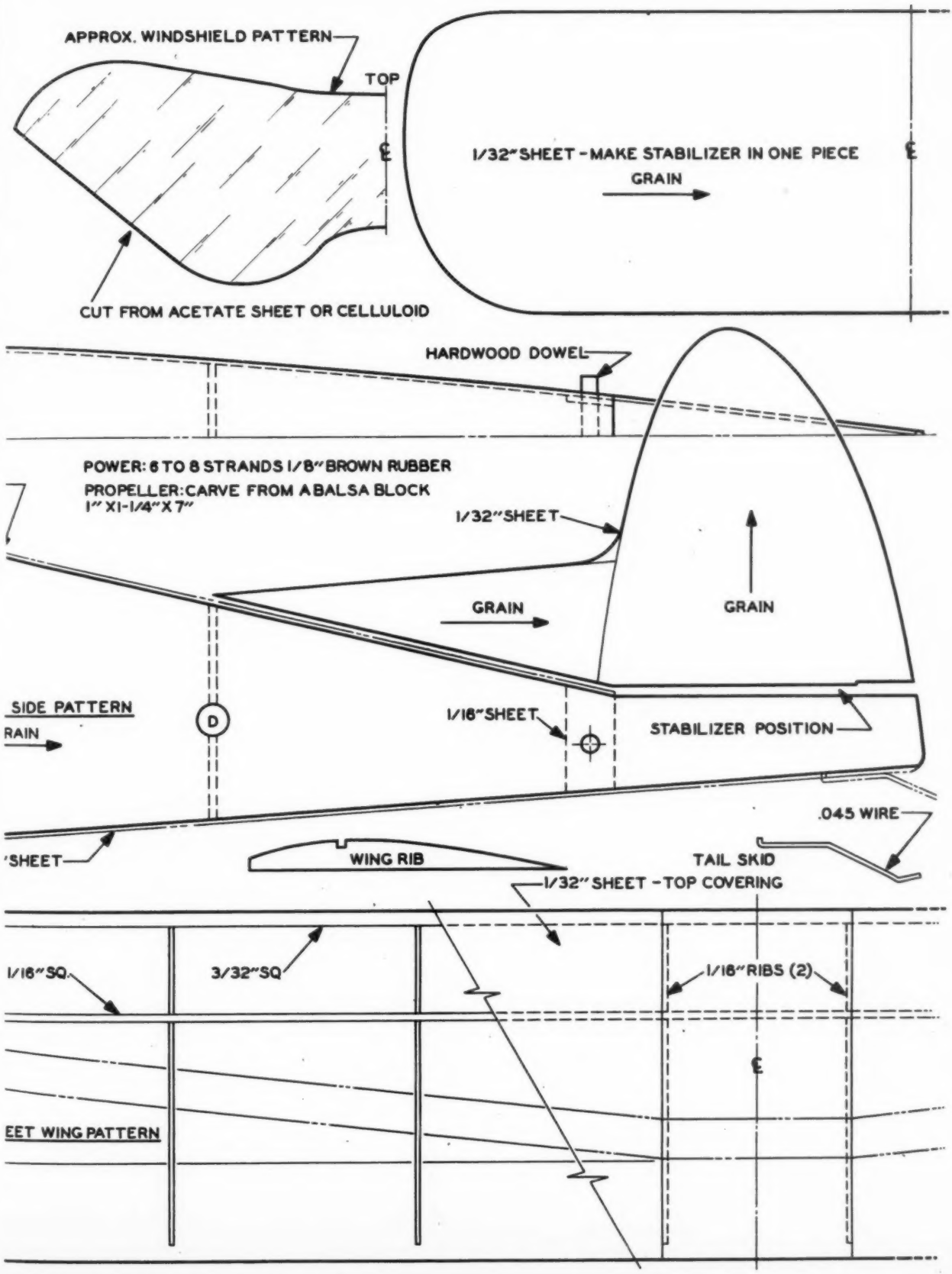
Studying the plans you will note that the construction is straight forward throughout and lends itself toward the prefabricated trend of model building. With a little extra time spent, you may add your own type of construction, such as using 1/16 sq. strips for the fuselage, built up vertical and horizontal stabilizers and for the wing, 1/8 sq. leading edge, 1/8 x 1/4 for the trailing edge and 1/32 sheet balsa for the ribs. The tips could be formed from 1/16 sheet. This would make a model of a more durable type.

The construction shown on the plans will produce a sport model of rugged features. In order to save time, may we suggest that you cut out all parts needed before assembly? Remember the plans are full size. Follow the wood grain symbols on all parts.

For fuselage, cut the two sides from 1/32 sheet and mark the locations for the 1/16 sheet formers which should be cut at this time. Also locate the hard wood dowel center, to later secure the rubber motor. Next, shape the cowl and hollow out for lightness; allow on each side wood for trimming. Finish by shaping the windshield former shown at the leading edge of the wing on the top and side views. Complete by bending the landing gear and tail skid. Preform the nose block from balsa, allowing an overlap of wood on all sides to facilitate finishing after assembly.

For the wing, cut from 1/32 sheet balsa the (*Continued on page* 34)


FULL SIZE PLANS
BALSA NOSE BLOCK 3/4"X1"X1-3/8"
1/16" SHEET
TIN NOSE STRIP
LANDING GEAR
.045 WIRE
ALL FORMERS 1/16" SHEET
B
A
C
D
1/16"SQ.
GRAIN DIRECTION FOR BOTTOM SHEET COVERING
GRAIN
BALANCE POINT
HALF TOP VIEW
SHAPE FROM 1/4" SQ. BALSA
1/32"SHEET
SOFT BALSA BLOCK 3/4"X1-1/2"X2-1/8"
1/16"SQ.
1/32"SHEET
TYPICAL CROSS SECTION
1/16"SQ.
1/16"SHEET
1/16"X1/8"SQ.
1/32" SHEET
TIP FORMER
WING TIP DETAIL
1/32"SHEET
1/32" RIBS
1-1/4" DIHEDRAL
1/32"SHEET TIP FORMER
GRAIN
BALSA WHEELS
LLOYD V. HUNT


APPROX. WINDSHIELD PATTERN
TOP
CUT FROM ACETATE SHEET OR CELLULOID
1/32" SHEET - MAKE STABILIZER IN ONE PIECE
GRAIN
HARDWOOD DOWEL
POWER: 6 TO 8 STRANDS 1/8" BROWN RUBBER
PROPELLER: CARVE FROM A BALSA BLOCK
1" X 1-1/4" X 7"
1/32" SHEET
GRAIN
GRAIN
SIDE PATTERN
RAIN
D
1/16" SHEET
STABILIZER POSITION
.045 WIRE
'SHEET
WING RIB
TAIL SKID
1/32" SHEET - TOP COVERING
1/16" SQ.
3/32" SQ
1/16" RIBS (2)
EET WING PATTERN

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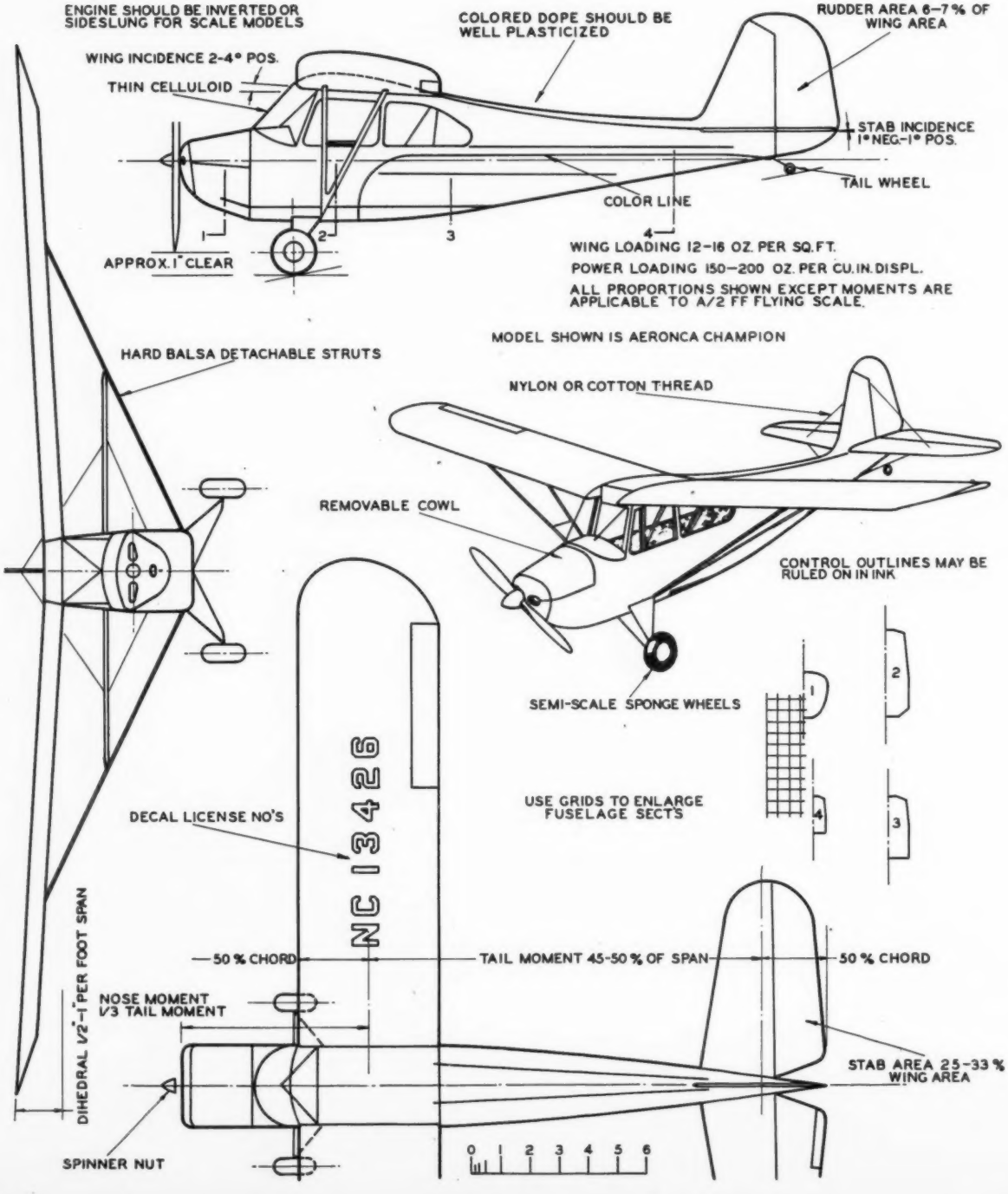
TESTORS
RCKFORD, ILLINOIS

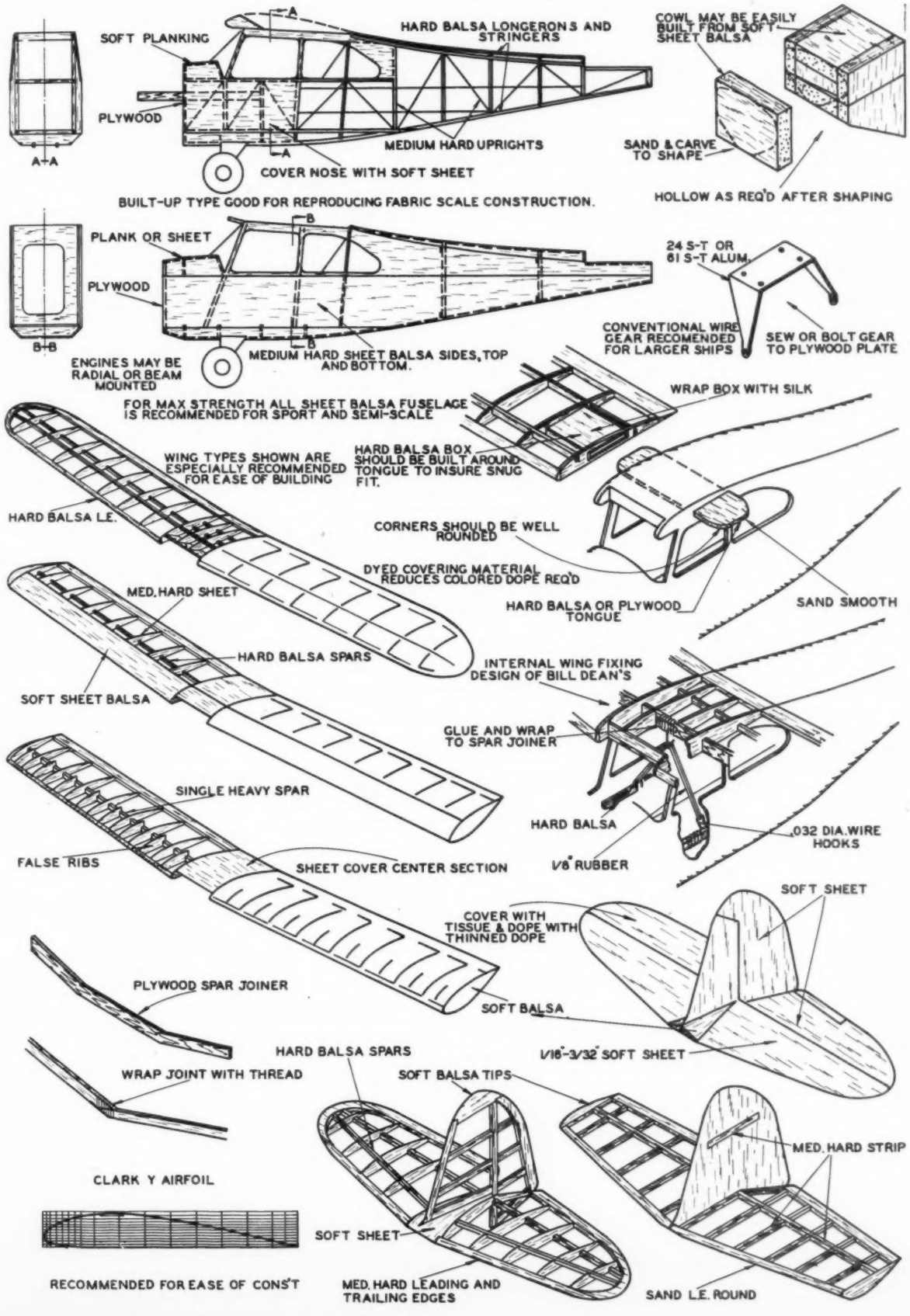
design detail

free flight sport

. . . by Harry Williamson

Contest designs are good for nothing but contests. So why not get on the band wagon with a neat flying Half-A sport, or even scale, free flight ship.


ENGINE SHOULD BE INVERTED OR SIDESLUNG FOR SCALE MODELS
COLORED DOPE SHOULD BE WELL PLASTICIZED
RUDDER AREA 6–7 % OF WING AREA
WING INCIDENCE 2-4° POS.
THIN CELLULOID
STAB INCIDENCE 1°NEG.–1° POS.
TAIL WHEEL
COLOR LINE
APPROX. 1" CLEAR
WING LOADING 12–16 OZ. PER SQ.FT.
POWER LOADING 150–200 OZ. PER CU.IN. DISPL.
ALL PROPORTIONS SHOWN EXCEPT MOMENTS ARE APPLICABLE TO A/2 FF FLYING SCALE.
MODEL SHOWN IS AERONCA CHAMPION
HARD BALSA DETACHABLE STRUTS
NYLON OR COTTON THREAD
REMOVABLE COWL
CONTROL OUTLINES MAY BE RULED ON IN INK
SEMI-SCALE SPONGE WHEELS
USE GRIDS TO ENLARGE FUSELAGE SECTS
DECAL LICENSE NO'S
NC 13426
50 % CHORD
TAIL MOMENT 45-50 % OF SPAN
50 % CHORD
NOSE MOMENT 1/3 TAIL MOMENT
DIHEDRAL 1/2"-1" PER FOOT SPAN
STAB AREA 25-33 % WING AREA
SPINNER NUT
0 1 2 3 4 5 6


A
SOFT PLANKING
HARD BALSA LONGERONS AND STRINGERS
PLYWOOD
MEDIUM HARD UPRIGHTS
A-A
A
COVER NOSE WITH SOFT SHEET
BUILT-UP TYPE GOOD FOR REPRODUCING FABRIC SCALE CONSTRUCTION.
COWL MAY BE EASILY BUILT FROM SOFT SHEET BALSA
SAND & CARVE TO SHAPE
HOLLOW AS REQ'D AFTER SHAPING
B
PLANK OR SHEET
PLYWOOD
B-B
B
ENGINES MAY BE RADIAL OR BEAM MOUNTED
MEDIUM HARD SHEET BALSA SIDES, TOP AND BOTTOM.
24 S-T OR 61 S-T ALUM.
CONVENTIONAL WIRE GEAR RECOMENDED FOR LARGER SHIPS
SEW OR BOLT GEAR TO PLYWOOD PLATE
FOR MAX STRENGTH ALL SHEET BALSA FUSELAGE IS RECOMMENDED FOR SPORT AND SEMI-SCALE
WRAP BOX WITH SILK
WING TYPES SHOWN ARE ESPECIALLY RECOMMENDED FOR EASE OF BUILDING
HARD BALSA BOX SHOULD BE BUILT AROUND TONGUE TO INSURE SNUG FIT.
HARD BALSA L.E.
CORNERS SHOULD BE WELL ROUNDED
DYED COVERING MATERIAL REDUCES COLORED DOPE REQ'D
HARD BALSA OR PLYWOOD TONGUE
SAND SMOOTH
MED. HARD SHEET
HARD BALSA SPARS
SOFT SHEET BALSA
INTERNAL WING FIXING DESIGN OF BILL DEAN'S
GLUE AND WRAP TO SPAR JOINER
SINGLE HEAVY SPAR
HARD BALSA
.032 DIA. WIRE HOOKS
FALSE RIBS
SHEET COVER CENTER SECTION
1/8" RUBBER
SOFT SHEET
COVER WITH TISSUE & DOPE WITH THINNED DOPE
PLYWOOD SPAR JOINER
SOFT BALSA
HARD BALSA SPARS
1/16"-3/32" SOFT SHEET
WRAP JOINT WITH THREAD
SOFT BALSA TIPS
MED. HARD STRIP
CLARK Y AIRFOIL
SOFT SHEET
RECOMMENDED FOR EASE OF CONS'T
MED. HARD LEADING AND TRAILING EDGES
SAND L.E. ROUND

POLK'S FOR RADIO CONTROL

Now it can be told!!! The wraps are off! The new "Hi-Power" "E.D." Radio Control unit is ready for delivery on the FREE BAND (27.255). The "E.D." R.C. unit is crystal controlled (precision ground to +— .04% on frequency) & ready to install! Completely factory tested. NOT A KIT, fully guaranteed! NOTHING TO BUILD! All switches, battery plugs, meter plugs, hook-up wire & even solder included.

Fully perfected Radio Control outfit now available to the modeller. World renowned for its reliability & ruggedness — so simple to use — nothing to test — just install & fly. Special transmitter chassis with "locked in" wiring & triple chrome plated telescopic whip antenna puts "E.D." out ahead with power output. Complete instructions included. Receiver will fit (with room to spare) in even the smallest R.C. model. All tubes included. Only a few dollars more than kit sets (which come less tubes).

$52.90

Complete 3 pc. outfit
Prices Separately
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AMA

official news

by RUSS NICHOLS and CARL WHEELEY

Wakefield team selected for trip to Sweden · Walt Good breaks Russian endurance record for radio control airplane · New AMA records now pending · Complete contest calendar

▸ WAKEFIELD TEAM. Following are those who have qualified to represent the United States at the Wakefield finals in Sweden this July 10-14:

Joe Bilgri, San Jose, California; Sydney Seldon, Jr., Tacoma, Washington; Carl Perkins, Jr., Mission, Kansas; Edward Lidgard, South Bend, Indiana; James F. Tangney, Newport, Rhode Island; Clifford M. Montplaisir, Richmond, Virginia.

Bilgri and Seldon qualified at the Semi-Final held at Bakersfield, Calif., on May 24-25, Perkins and Lidgard qualified at Kansas City, Mo., on June 7-8, and Tangney and Montplaisir qualified at Baltimore, Md., on June 7-8. Total times: Tangney—13:58.7; Montplaisir — 13:25.5; Bilgri—14:07.6; Seldon—13:18.9. A complete report has not been received from the K. C. Semi-Final as yet.

Congratulations, boys! We know you'll do your best in Sweden.

▸ WALT GOOD BREAKS RUSSIAN F.A.I. RECORD. During an F.A.I. record attempt for radio controlled duration models held June 15th at Andrews AFB, Md., in conjunction with the National Capital Model Air Show, Walt (Radio Control Committee Chairman) Good of Bethseda, Md., succeeded in keeping aloft his Forster .29 powered *Rudder Bug* for 40 min. 27.8 sec., beating the Russian-held record of 23 min. 7 sec. The performance is being submitted to the Federation Aeronautique Internationale in Paris for official recognition.

Walt's model carried two large extra fuel tanks giving an engine run somewhat over 20 minutes. With the extra weight the model had a little trouble making unassisted take-offs but, on the third attempt, the model was airborne after a run of approximately 200 feet. Walt was able to land the *Rudder Bug* 102 feet from the point of take-off, well within the maximum of 1640 feet allowed. Control was accomplished on the 27.255 mc. frequency with equipment of Good's own design. Walt reports that during the entire flight he had only one extra "beep" from his "beep box."

▸ AMA RECORDS PENDING. *Gas Model, Control Line Speed, Class A Senior*—123.41 mph. Flight made by Eugene B. Stiles, Sheppard AFB, Tex., on May 25, at the 6th Annual Forth Worth Plymouth Dealers' Model Airplane Contest. Stiles' model, an original design, was powered by a McCoy 19 with a 6-1/4"D x 10"P Rev-Up prop. The model featured a fuselage of 12" length made from mahogany with an aluminum half-pan manufactured by Friedland and Stiles, 12" wing span with the wing being made from .012" aluminum, and a 1-1/8" spinner. The model weighed in at 11-1/2" ozs.

Gas Model, Control Line Speed, Class D Senior—157.55 mph. Flight made by Franklin Francisco, Rochester, N. Y., on June 1, at the Plymouth Dealers of Rochester 2nd Annual Meet. The model, designed by Wilbert E. Barleben and John P. Kehoe, was powered by a McCoy 60, weighed 28 ozs., and used a Rev-Up A style 9"D x 11"P prop. Most outstanding feature of the model is a wing laminated from two sheets of 1/8" birch plywood and a top layer of balsa.

Tow line Glider, Class C Open—15:18.3. Flights made by J. H. Tison, Albany, Ga., on May 25, at the 3rd Annual South Georgia Model Air Meet. The model, an original design, has an eliptical shaped wing of 175 sq. ins. with V dihederal, mounted on a pylon over a diamond fuselage.

Outdoor Hand-Launched Glider, Class B Junior—1:03.0. Flights made by John Thornhill, Washington, D. C., on April 20, at the Chantilly, Va., Record Trial. Thornhill's model, an original design, had rectangular shaped lifting surfaces.

Outdoor Hand-Launched Glider, Class B Senior—7:04.6. Flights made by James Carpenter, Lubbock, Tex., on May 13, at the Texas Eagles' Record Trial. The model was designed by Carpenter, had a 25" wing span and 4" center chord with eliptical tips, 12" stabilizer span, and 23" fuselage.

Free Flight Gas Models, Class C Senior—

(*Continued on page* 54)

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SPECIFICATIONS	WILDCAT	BOBCAT	COUGAR	MUSTANG	BEAVER
Wing Span	39 in.	39 in.	51 In.	48 In.	44 In.
Length Overall	30¼ In.	30¼ In.	36¼ In.	36½ In.	26 In.
Wing Area	330 Sq. In.	387 Sq. In.	412.5 Sq. In.	372 Sq. In.	233.375 Sq. In.
Fap Area	55 Sq. In.		137.5 Sq. In.	84 Sq. In.	
Total Wing Area	385 Sq. In.		550 Sq. In.	456 Sq. In.	
Air Foil	HJ-03515	HJ-03515	HJ-03515	HJ-04015	HJ-10400
Finished Wt. (Approx.)	2¼ Lbs.	2 Lbs.	2¾ Lbs.	2½ Lbs.	6 Oz.
*Wing Loading	.093 Oz.	.083 Oz.	.084 Oz.	.087 Oz.	.0257 Oz.
*Wing Loading with Occupant					.0428 Oz.
Class	A-B	A-B	B-C	B-C	½A
Type	Full Stunt	Stunt Trainer	Super Stunt	Full Stunt Scale	½A PAA Load

*Per Sq. In. (Approx.)

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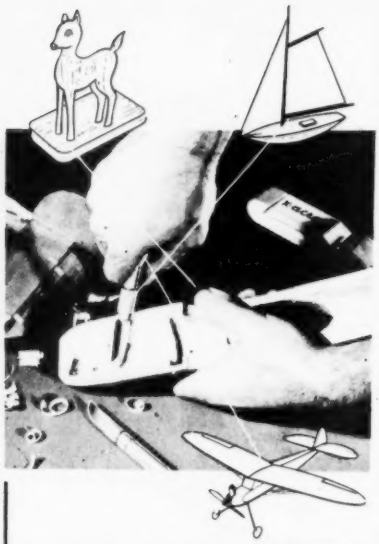

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Skyscooter

(*Continued from page* 25)

required ribs. Mark on sheet balsa the wing outline or, using a template, cut to shape the wing. Locate the point where the trailing edge is to be beveled. Using a sandpaper block, complete this step.

Vertical and horizontal stabilizers are cut to outline. (Horizontal left hand side shown.)

At this point, all the parts needed for final assembly are now ready for finishing. Start with the fuselage by cementing in place the formers, beginning with the largest former and, working forward to the nose, cementing in place the required formers. Let these parts dry before finishing the basic fuselage construction. Then add the remaining formers aft. Cement in place the landing gear. Next cover the top and bottom, noting the grain symbols of the 1/32 sheet balsa to be used. Cement the cowling to the fuselage; while it is drying, add the windshield former and nose block. Let these parts dry before sanding to shape. Finish the fuselage by adding the tail skid and windshield. The pattern shown may be enlarged to allow for trimming. Due to different types of construction, try a paper one first to check.

The wing should be scored at the dihedral and wingtip angle points. Block up to the shown dimensions and cement, forming a skin over these cracks. The leading edge strip is added next. Cement the ribs and the remaining structure to the bottom part of the wing outline. Before covering the top with 1/32 sheet balsa, slightly bevel the leading edge to the contour of the ribs. Start covering by adding the center section. Maintain a slight surface on both sides of the two ribs to allow for the remaining panels to be cemented. Before cutting the center section and two outer sheet panels, keep in mind that they will need an overlap at the trailing edge. These parts should be cut from 3" stock; if it is not available, butt joint a strip to a 2" sheet. The top covering length will be a good 2-7/8" wide. Cement the sheets first to the leading edge, then bend back and pin in place the wood to the trailing edge. Cover either the right or left panel next. Following the same method used for the center section, be sure to pin down the panels to the board before completing the covering to help prevent warps. See the sketch for more details.

After the wing has been covered, sand the leading edge to shape; finish by sanding the complete wing. This will not only smoothen it, but also cut some of the weight. Cement the wing to the fuselage, making sure that it lines up. Lastly cement in place the tail surfaces, checking for alignment.

A machine cut balsa or hardwood prop may be used. We used a single bladed prop, but it is not necessary.

Power is supplied with six strands of 1/8 brown rubber. After the model is adjusted use eight strands for a higher rate of climb.

The wheels can be made from two 1/16 sheet balsa discs, cemented cross grained. Pierce for axle holes before cutting and sanding. Add aluminum inserts to each wheel; two washers to each side of the wheel will also serve the purpose. Use hardwood wheels to help add weight to the nose if needed.

For finishing, use three coats of sanding sealer, sanding after the first and second coats, the third application to be the finishing coat. We would suggest not using any colored dope, because of the weight added. We trimmed our model with Trim Film as shown in the photos.

Make test glides over grass. Add clay to the nose or tail, whichever is needed for a smooth glide. Warp the tail surfaces slightly to govern the actions of the model in flight. If model requires it, add side-thrust to the nose block behind the sides by shimming with a small sliver of hard wood. For longer flights use a winder, but make provisions on shaft.

THE END.

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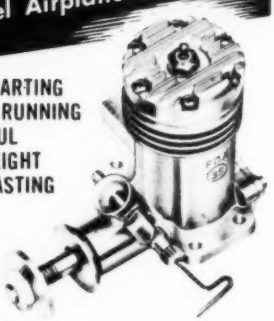

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Why I Like Speed

(*Continued from page* 11)

It was a rare day when I could break 100 mph with those monsters but when I changed to smaller ships and new engines, things began to move. The planes began to run away with me!

I guess I have funny ideas about what a speed model should be like, First, comes proper size. The plane should be small and within a reasonable weight but, if it is too small, you cannot get the proper amount of fuel. Engines should never be taken apart until you definitely know that they are not going to turn a maximum number of revs per minute. If an engine does not turn up properly, then work on it. Fuels must be suited to the climate. But I never change fuel, whether or not it is raining, hot, or cold. Props are a question of repeated trial and error until the proper number of rpm's are produced for the weight of the plane. I think that a speed job should be flown close to the ground with the lines parallel to the ground and pointed directly away from the flier.

Let's see if we can't be more specific. You hear lots of talk about engines. So far I have reworked only one of my engines. That is my class B engine. This is a *Sportsman .29* (this idea came from a model magazine) with a *Redhead .29* front plate and a *Sportsman .36* back plate with a *Redhead .49* intake. I opened the ports. Nevertheless, I find that speed costs no more than stunt to fly. My engines last at least two flying seasons. I fly them only at contests and I am sure they last as long as stunt engines.

How do I decide when to work on an engine? Well, after breaking it in, I check the rpm's with the size propeller I will use on the particular airplane. I happen to use Tornado props and McCoy engines. Other folks may use other props and powerplants but I am used to this one combination. For Class A ships, the prop is 6" diameter by 9" pitch; for B, it is 7" x 10"; for C, 9" x 10"; and, for D, 9" x 10". Sometimes I trim a little off the tips and check the prop for balance.

Now, if the engine doesn't turn at least 14,000 rpm, the first thing to check for is a compression leaks around the glow plug, and making sure all screws are tight. Second, check the rotary valve for clearance; third, check the shaft and bearings; fourth, the piston, rings, and liner. Very often the cylinder liner is recessed too deeply into the cylinder casting so that the compression leaks out between the head and the liner. The cylinder casting then should be dressed down until the head touches the liner.

Often I grind the ports open as much as possible with a small electric emery wheel. My father often helps me with the tougher problems. We had to use special machine tools for fixing the crankcase and backplate in the hybrid engine described above. He has helped me in many ways. Always interested in wood work and having good power tools, he taught me how to use them at an early age. He helps with engine repairing and rebuilding. If I get stuck on building, designing, or construction, he is always willing to help out. So much for the engines.

Fuel is simple. My own is mixed from one part Bakers AA castor oil, one part nitromenthane, and two parts methanol. Props require experimentation, as I already said, but we have a simple rule that helps a lot. For a plane that weighs four to five lbs., as a D job does, use less pitch to take the rpm's up to 15,000. For a ship that weighs two or three lbs., use more pitch to keep the motor at 14,000 rpm. The reason for doing this is that more thrust is required for the heavier plane and less for the lighter one. While the example applies to the largest class, the same principle can be applied for the three smaller classes.

Suppose the plane is in the air. The engine

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picks up fine but the ship is not going places. Then the prop is too small. Increasing the pitch probably would be the best thing to do. But if the engine should slow down after whipping or leading plane, the prop is too large, and the pitch could be lowered. Keep doing these things until the plane reaches its peak.

On my Class C job I have been trying to cut down the propeller but with little success so far. I have not tried everything yet on the A job but believe I will try new rings and then open the ports and the intake venturi.

Tanks are important. My experience has been that a low square tank in the bottom half of the fuselage was not good as it would run lean on the ground and then go rich in the air. By using a high, narrow, long tank, with the tank height projecting as far as possible into the upper shell, I was able to close the needle valve more and prevented the engine going rich in flight. In the beginning the pick-up tube was back too far. It works best when moved to the center of the tank.

Other than that learning to fly speed requires a few fundamental steps. One is a plane that is not sensitive on the controls. If it isn't stable it will fly up and down which causes you to lose speed. Another is a trick to taking off a dolly. Incidentally, a dolly is best for the three larger classes but I feel it is better to hand-launch an A job. Follow the dolly with a little slack in the lines until it picks up speed, then let the lines tighten. This keeps the dolly from turning into the circle. It helps to wrap Scotch tape around the inside front tire so that it can slip across the pavement without upsetting the dolly during take-off. When hand-launching hold a little down to keep the plane from going straight up and looping.

I always fly the plane rather high until the engine "comes in," then slowly bring it down until it is flying about five ft. off the deck. This slow descent prevents the engine from getting rich. I feel that the closer the plane flies to the ground the faster it can be made to fly. Flying takes practice. I practice a lot with stunt models but never fly speed except at contests.

Weight is something you hear the boys argue about. In my case weight doesn't seem as important as size. My first speed ships had large fuselages with large airfoil lifting type wings. When the glow plug came out I began to make them smaller in every way. It is vitally important to make the fuselage as thin as possible. On my D job I filed the crankcase a little under the mounting lugs and drilled new holes for mounting. The cowl is as narrow as possible, leaving just enough space for cooling the engine.

(*Continued on page* 41)

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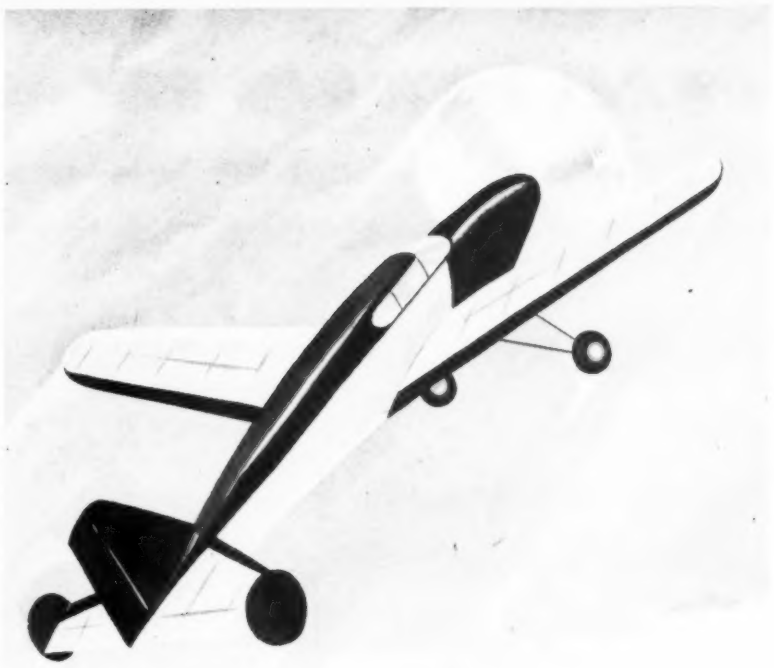

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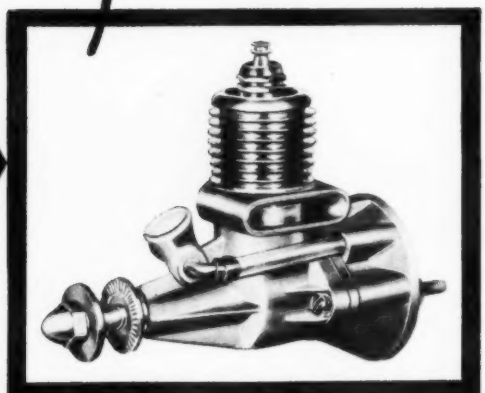

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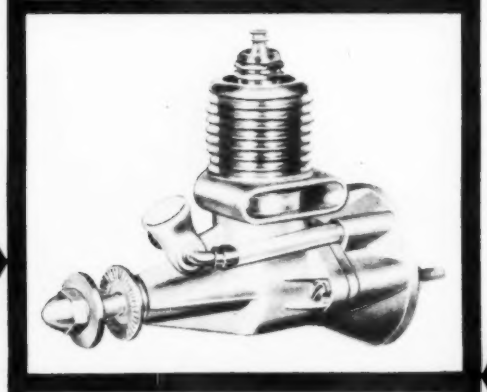

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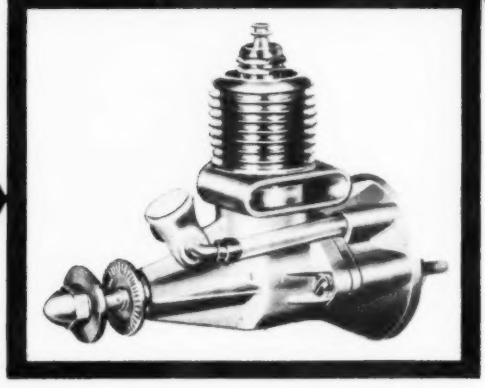

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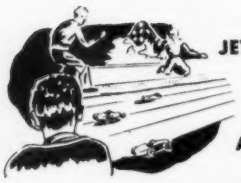

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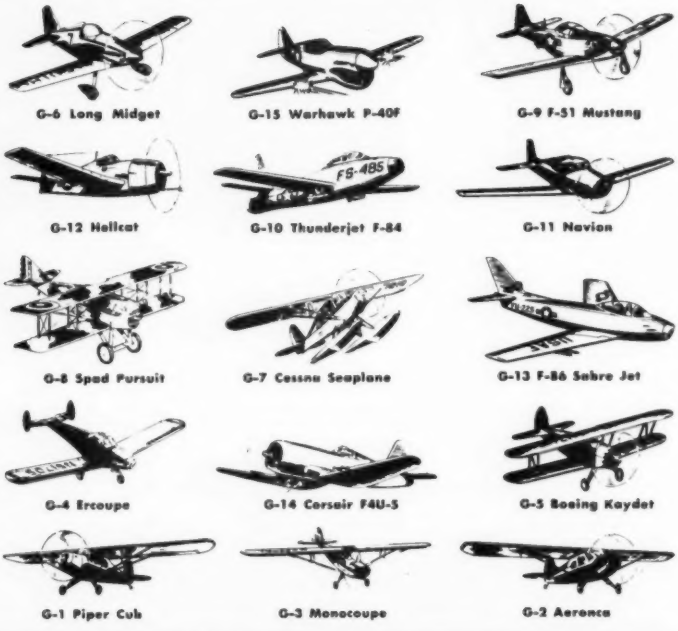

G-6 Long Midget
G-15 Warhawk P-40F
G-9 F-51 Mustang
G-12 Hellcat
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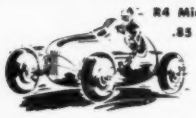

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Monogram Models, Inc. 3421 WEST 48TH PLACE, CHICAGO 32 { MODEL AIRPLANES • SHIPS JET POWER RACERS

My D and C ships are the same size, about 17-1/2" long and with 18" wings. The B design is 12" long with a 13" wing and the A ship is 10" long with a 9-1/2" wing span.

My first speed models were made from balsa wood but now I use magnesium bottoms *(Hell Razor)* with bass wood tops and cowlings. My wings are all metal, of symmetrical cross section, with sheet aluminum, and rivetted trailing edge construction. Both the stabilizer and elevators are plywood. I once used offset motors and rudders. I no longer use offset rudders. Metal bottoms and hardwood tops make a more durable airplane. Aluminum wings are lighter and faster than wood wings.

I expect to go on flying speed. This event has a future and the next five years will be a challenge. I hope to have lots of competitors.

Scrap Box

(*Continued from page 4*)

No sir! He had the classroom to himself and received the undivided attention of the instructor. Try to explain anything they may ask. Sure, it sometimes may seem a little foolish, but remember, you too, were just as simple at one time or another! Let's promote models. If we don't, nobody will! A good flying outing and a few bull sessions on unrelated subjects are all that are needed to keep the kids happy.

The NOME Club has its own flying field chiefly through the generosity and interest of George Cataline, owner of Watson Airport. George even installed two control line circles gratis! The site is also perfect for free-flight. The club carries AMA insurance with provisions for insuring the owner. They have a field now and want to keep it. All rules of safety are constantly enforced.

▸ Received the usual excellent coverage from Mom and Pop Robbers of the West Coast Finals per the American Wakefield Team entries for the trip to Kungungsund, Sweden, where, on July 10th to 14th, the members will compete for the exclusive Lord Wakefield Trophy. Since Virgil Cone reports this meet, will say no more here.

▸ Walked in on the recent meet held at Lynwood Model Air Park. Quite a layout. All grass and plenty big. Times and rules are set up for flying sessions and all hands obey them to the letter. Enjoyed the big sign with the data finished off with the caption "Flying Safe is Playing Safe." The u-control part of the contest had the usual slam-bang stunt event, hot speed runs, and plenty of just darned good flying. Our nose was stuck in the scale circle again. Fred W. Dunn of Warren, Ohio gave us a good look at his *Lil Stinker*. This job had "it" and walked off with first place honors. Dunn took second at the Mirror Meet in '51. The silk covered finish shone like glass. Paint job terrific. Check these points—fuselage made up of aluminum tubing, cockpit interior to the n'th degree (Fred was only a few miles away from the real ship when his model was under construction so took photos of the instrument panel, blew them up and installed the whole deal scale size), stick worked elevators and ailerons, rudder pedals operated rudder, tail skid to scale, even to shocks. Particularly enjoyed the cowl metalwork and riveting. Everything was there and the judges missed nothing. The "Stinker" flew just like the real thing and was doing a nice job of it till pilot error "clobbered" it going through the horizontal eights. Not too much damage and it will be back in the air shortly. A *Torp* 32 spun the handmade inlaid prop. Gross weight, 24 ounces.

R. C. Beattie had his *Bearcat F8F*. This job was an all-out effort for the Carrier Event. Over a year's work went into finishing up the many details such as: retractable gear, flaps, retractable tail wheel, hook drop out, two-speed engine control, bomb and release (added for kicks and plenty realistic). Beattie was a former Carrier Pilot and he says he flies the ship as he did when in the Navy. He told us all you had to do was fly in, stall, and drop in. Sounds easy? The five lbs. of airplane (model, that is) was powered with an Anderson Spitfire.

▸ Always looking for something new and novel in Team Racing, Granger Williams came up with a pusher job that's a "sharpie," The twin boomed racer (saw a picture of the real one so it's legal) was powered with a Torp 29 incorporating the Mac 29 bearing and extension shaft. An 8½ x 7½ cut-down pusher Super Screw prop was used. Wing area 126 sq. inches, weight 24½ ounces. Particularly interested in the stability of the gem. The c.g. was set approximately at 35 percent and very fast and flat take-offs were simple. There was no tendency towards jumping into the air, which is rough on the other competitors. This slick ship has turned in times of over 85 mph consistently.

▸ Jerry Gaston has shelved his *Stubby No. 1* and *No. 2* for the time being. His new T.R. is another beautiful model. Simple design and clean building makes this one another eye catcher. Jerry has powered this one with a Fox 29 racing engine which gives him an average speed of approximately 83 mph. Caught Gaston turning 41 laps on the one ounce of fuel. Mixture? Castor oil, alcohol, and 12½ percent nitro methane.

The Zephyr

(Continued from page 16)

Cut out one center rib. To save a little weight, the tip ribs were made indoor style. An upper and lower form of the rib is used with the spar cemented between. These tip ribs are cut out by using the main rib as a template and then trimming off the ribs on the trailing edge side only when fitting into wing. Make these ribs of 1/16" sheet balsa and about 3/32" deep. Make two tip ribs of 1/8" sheet balsa. It will be necessary to shim up the front of the trailing edge 1/32" when building the wing. Build the two wing halves; when dry insert and cement the tip spars in place and then the main spars. After sanding, place in dihedral as noted on the plans.

Cut out nine full-size ribs and two half ribs. The stab tips are cut from 1/16" sheet balsa. Place the leading and trailing edges in position and pin to board, then cement tips in place. Next, notch the spar so that it will fit over the tips. Cement spar in place. Insert and cement ribs in place. When dry, sand leading edge to shape. Cement three pieces of 1/16" x 2" x 3-1/2" together. When dry, sand lightly and cut out the rudder. The stab hold-down hooks are cemented in place after the stab has been covered.

The wing and stab are covered with Jap tissue or some other comparable covering material. Give the wing and stab two or three coats of clear dope and follow with two coats of fuel proofer. All wood parts, such as the fuselage and rudder, may be given three coats of clear dope and sanded lightly between coats; then follow with two coats of fuel proofer. Model may be color doped if preferred before fuel proofing.

The *Zephyr* climbs and glides to the right. Using low power, test model with about a ten-second engine run. If any turn is needed under power it can be had by turning the trim tab on the sub-rudder. To make model turn while gliding tilt the stab. By tilting the stab so the left side is down, the model will turn to the right. No side-thrust was used on the original model. When properly trimmed the model should consistently turn in flights or 2-1/2 min. or better. THE END.

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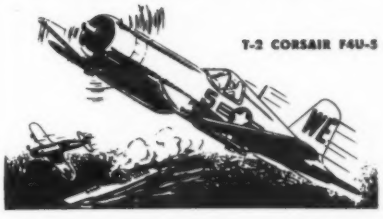

T-2 CORSAIR F4U-5

T-3 THUNDERJET F-84

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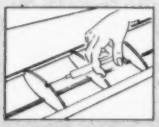
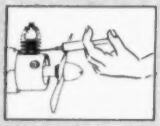
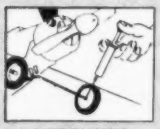
Allyn's ALL PURPOSE GUN


MODEL MAKING


ENGINE PRIMING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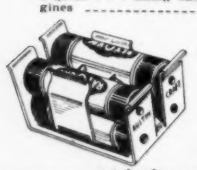

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The Bounder

(Continued from page 12)

half would increase weight but would be stronger, and the wings would not flex in flight, causing drag. To compensate for increase in weight, I painted the model with just four coats of clear fuel proof dope instead of using filler and paint, which add quite a bit of weight.

If this sounds convincing to you and you would like to try your hand at speed, I would like to suggest you try my Class B model, the *Bounder*. This ship is a consistent performer and winner, easy to handle and strong. Its speed has never dropped under 124 mph. At the Dallas Nationals, it took a first in Junior with a 127 plus mph, and 125 plus mph in Senior. The construction follows.

The fuselage is started by securing the metal-bottom half. It can be obtained from most hobby shops under the name of "speed pan." However, it is much cheaper if you make your own wood pattern from hardwood and have it cast at your local foundry. (Remember, aluminum shrinks 5/16 to the foot.) One of the secrets of the metal-bottom is to have the top of the pan machined so as to give the motor a perfect mounting, thus adding to the performance of the engine, as Dooling Brothers mention in their instructions.

Drill and tap the pan for 5-40 bolts. Taps are a small instrument to thread holes, and you must have a tap vise also. To use, drill hole first as desired and insert tap to thread. When tapping, make half turn in, half back out, in whole turn, out half turn and proceed as to the latter method until hole is finished. You will find these at your local hardware store also.

The spinner is 1-1/2" B & D Tru-Arc, but any good 1-1/2" spinner will do. With engine and spinner in place, mark off the spinner. Remove the engine and file the bottom to shape. It can be polished if you desire.

The tank is made from shim stock or tin can metal. The tank shown in the plans is extra large and will assure you an official flight. It is held in place in the usual manner with two small brackets tapped into the bottom and soldered to the tank.

The stab can be cut to shape from a piece of 3/32" plywood. The airfoil is the same as that of the wing. Cut out flipper and mount horn on it with thread bindings. The horn is made from a piece of galvanized iron; drill a .040 hole for pushrod. Now you can mount the stab in place with two 2-56 bolts which are tapped into the lower bottom half.

The top half is made from a piece of 3/4" x 1-7/8" x 13-1/2" sugar pine. Lay this block on the metal bottom and trace the outline. Then cut to shape. Carve the top round, leaving the flat part to mount the wing and cowl on. Now gouge the inside to a thickness of 1/8" also cutting holes for engine and bellcrank.

The wing is cut from a piece of 1/4" x 2-1/2" x 14" sugar pine. Cut the wing to outline on the plans and carve in the airfoil as shown also on the plans. Notice that the wing is tapered on the top from 1/4" at the center out to 1/8" at the tips. After shaping is completed, gouge out the slots for the 3/32" aluminum tubing; also cut a place for the 1/4" x 1/2" x 2" beech wood insert. After these are installed in the wing the bellcrank can be made (I made mine from an old Froom spinner backplate, but any aluminum of this type can be used) and installed on the bicycle spoke using a soldered washer to hold it in place. Now you can cement the wing on.

The cowl sides are 1/32" mahogany plywood, but first wrap the cylinder head with masking tape. Then bend the sides around the cylinder, leaving 3/16" opening in front and 1/4" opening in rear for cooling. The top of the cowling is carved from pine to fit into place inside the sides. Now cement the top in well. Fillets are necessary around the cowl

ing and wing to give it strength. Plastic wood seems best. The ship should be sanded all over, cutting out for glow plug, stab, etc.

The finish is only four coats of clear fuel proof dope. Do not sand between each coat. This will fuel proof your plane and save weight which will in turn increase your speed.

The dolly is made from 1/8" soft welding rod with a 1/16" music wire trigger which goes into a hole in the bottom of the ship, which is drilled at 30 degrees. This plane must have some type of locking trigger dolly to get off, due to its small wing area.

For flying, I use a stock Dooling 29 with a 7 x 9 series of 35 Tornado prop. I use the same fuel during all conditions which is two parts castor oil, four parts wood alcohol, and four parts nitromethane. Keep your engine clean and it will perform well. A good grade of nitromethane can be obtained from Distillation Products Industries at Rochester 3, N. Y. One kilogram or about a quart costs $2.85 without postage. Wood alcohol and Bakers AA Castor Oil can be obtained from any druggist. Nitromethane evaporates easily so don't mix more fuel than you plan to use in a day's flying. Keep in a cool place.

If you have had previous control line flying experience, you shouldn't have any trouble getting off, if engine is properly adjusted on the ground. A skid can be installed on the bottom when flying on concrete; wrap the wheels with Scotch tape. If you haven't had any control line flying experience, I would suggest you build any u-control sport plane to practice on.

Relays

(Continued from page 24)

the rheostat until the meter reads .8ma, then set the armature adjustment (spring tension) until the armature is attracted. Reduce the rheostat setting to .6ma and adjust the normally open point (at this time, the closed point) until the relay opens. A piece of cellophane between the armature and the pole piece will eliminate any residual magnetism and make adjustments and operation of the relay easier.

For those desiring lightweight midget relays, Control Research furnishes a type that is about one-half inch in diameter and one inch long. It weighs one-half ounce and is unaffected by vibration. The sensitivity is not as great as that of the Kurman or Sigma but it offers many possibilities for the future and in certain types of circuits.

The use of relays makes possible many variations in control circuits while still using a single receiver. While it is admitted that several relays will add a little weight to the receiver control system, their usage has the advantage of not being an electronic type of control and, once adjusted, will always hold that adjustment. And then there is only one receiver to tune. THE END.

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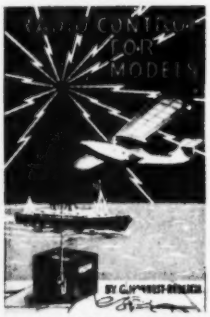

SOME OF THE CONTENTS — "Radio Control for Models" written by G. H. Redlich, expert radio development engineer, is written in a manner that all can understand. The Author has successfully piloted a model across the English Channel via radio control, has displayed his aircraft etc. to British Air Force & military experts all over Europe. Good Brothers of U. S., Pepin of France & other experts are all represented in this book. Totals 128 pages, 14 chapters, high quality paper and excellent binding. Hundreds of new, different ideas are shown, measurement of amps, insulators, magnets, shielding etc., all the important things you need to know to build your own set or to keep a purchased set in top operation condition. Escapements with 2 to as many as 12 operations shown, over 175 photos & circuits are given for sets, use of electric motors for control, solenoids, delayed action relays, mechanical movements, beep box used by Good Brothers, boat layout with forward, reverse, stop and half speed controls. Scaled down drawings are given for "Rudder Bug," ½ A "Queen Bee" and "Jige 213" radio controlled powered glider by Pepin of France. Complete trouble shooting information for senders, receivers etc. Here is a book you will use in your workshop and on the field with your models. Quality from cover to cover. Yours for a better knowledge of the many problems of Radio Work. . .

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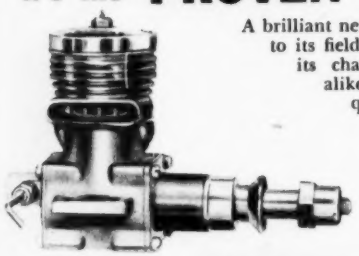

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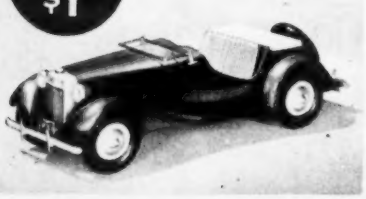

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Planes in the News

(*Continued from page 5*)

service. They'll carry 14, of which 12 are littercases. The *H-21B* is an assault transport with space for 20 troops. The Air Force will get this version. The Army will buy the *H-21C* for troop carrier and resupply duties. All these will have the Wright R1820 engine, but the power of the various versions will vary from 1,150 to 1,425 hp.

Main cargo compartment is 20 ft. long; there are front and rear doors at truck-bed heights. And the rotors clear trucks even in the drooped position rotors assume when they're standing still. If the cargo is too big for the cabin, it can be slung underneath.

Overload gross weight of the *H-21* series is given as over 14,000 lb. Overall length of the fuselage appears to be about 50 ft. As one example of performance, Piasecki says that the *H-21* can complete a 110-mi. mission in one hour. This means cruising speeds higher than that, of course.

▸ *Another Packet*—Fairchild continues to do things with the basic *C-82 Packet*. This time it's the *C-119H*, which is pretty much of a new airplane. The fuselage pod is still the *C-119* that we all know, but the wing has acquired new elegance along with its increased aspect ratio. And the tail and landing gear have also been redesigned.

Span of the new wing is 148 ft., which is 39 ft. larger than the *C-119* wing (at 109 ft., if you're too lazy to subtract. These wings don't contain fuel like the old *Packet* surfaces did. Instead these tote two large external tanks which hold all the fuel in the airplane—repeat, all the fuel. Engines are the big Wright R3350-30W compound engines, so what fuel there is will certainly be used to best advantage. But this bothers me anyway, because the story is that the new cargo capacity is 27,200 lb. instead of 10,000 lb. And that is almost three times the old amount. Even with the new engines, this doesn't seem like it would result in lots of range.

▸ *Mistaken Impression*—In these days of no American jet transports, there is one repeated statement which is intended to excuse us and explain De Havilland's scoop of the world. The detractor of the *Comet* generally says that the entire program was subsidized by the British taxpayer. In fact, this detractor is also liable to hint that, in effect, our aid to Britain went into the plane either directly or indirectly.

It's a real pleasure to meet one of these guys and to tell him he's lying. They pop up often lately, because of the interest here in the jet transport, and so maybe here is a good place to help set the record straight.

First, de Havilland did not build the *Comet* with all-government money. Second, the only U.S. money that will ever get into the *Comet* program will be for the purchase of some of the beautiful craft by some wide-awake American operator.

In a way, DH did get government support. The *Ghost* turbojet was financed with government funds—as is any turbojet we have. And The Ministry of Supply bought two production Series I *Comets* and one Series II; but that's a standard routine in England. The Ministry buys and owns the experimental aircraft in many cases.

After the design had been worked out—in 1945, by the way, which was before Marshall Plan aid — British Overseas Airways Corp. guaranteed to buy ten of the *Comets* at a fixed price.

If this be subsidy—even though BOAC is a government corporation—I fail to recognize it as such. But our Civil Aeronautics Board's plan is a direct subsidy of $1 million per airplane, free gratis to the enterprising American who designs a jet transport and builds 15 of them. THE END.

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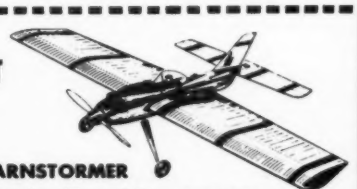

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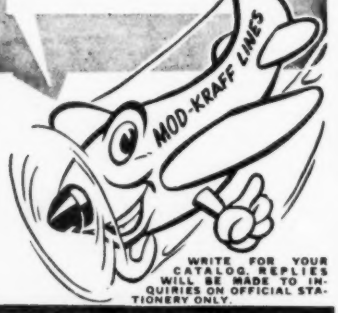

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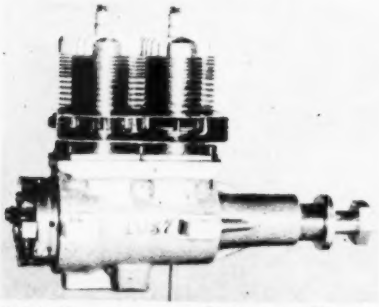

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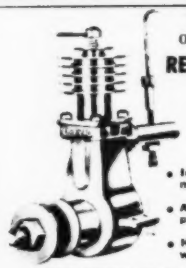

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First "Modern" Fighter

(*Continued from page* 18)

material from which to construct airplanes. The Ford merely verified to American designers facts that European aircraft manufacturers had discovered years earlier.

It remained for a "fall guy," however, to set the stage for development of the airplane which is the subject of our story this month . . . the Boeing *P-26*. The fall guy was the old Travel Air "Mystery Ship"—model R—which, in the 1929 National Air Races at Cleveland, literally beat the pants off all speed competition. Travel Air's "Mystery Ship" was the first civilian aircraft to beat military aircraft in a free-for-all speed competition, known as Event 26 at the 1929 National Air Races. The red and black Travel Air R, piloted by Doug Davis, averaged nearly 200 mph over a closed course, to win the event. Its top speed was 240 mph, its engine a Wright *Whirlwind* of 300 hp, air-cooled and N. A. C. A. cowled. The model "R" was a low-wing as well, and set the stage for the configuration of aircraft as we know them today. Boeing's *P-26*, however, was the aircraft that established the pattern from there on—low-wing, air-cooled and all-metal—that has survived to this day.

The Army suddenly admitted that the monoplane had a place in military aviation, something they had not previously accepted as a military configuration. They liked the speed available through use of an efficient low-wing craft, had an eye cocked on the day when the problem of stowing the landing gear in that low wing would be solved. Then there was the inherent dependability of the air-cooled radial engine with its weight advantage over the liquid-cooled power plant of the same rating, and the methods of cowling that held so much promise.

A new fighter built on these ideas would be intriguing. The Army began talking to manufacturers. They talked in terms of an all-metal fighter. At Boeing they found a sympathetic ear—and some ideas that Boeing had been mulling over in its engineering department. The customer, the Army, and the producer, Boeing, saw pretty much eye to eye on the problem, and a contract was let to the aircraft firm to produce three ships. These were the Boeing *XP-936* fighters, model 248 on Boeing's books.

If the term "radical" is taken to mean "different," then the *XP-936* was definitely radical . . . as different from any previously ordered pursuit as night is from day. Working together with the Army, Boeing designed the ship late in 1931 and delivered the first article March 17, 1932. Although the Army was an interested party, Boeing built the three *XP-936's* on speculation; the contract was not actually dated until June 15, 1932. The Army supplied engines and instruments only. The first flight was accomplished on March 20, and the last airplane was delivered April 25, 1932.

CONRAD CONROD
By Bob Golden
POOR 'OL CONNIE, HE'S BEEN TRYING TO SNAG THIS THING ALL AFTERNOON
LOOKIT THAT, COMMANDER—HERE HE COMES AGAIN
OH
NO

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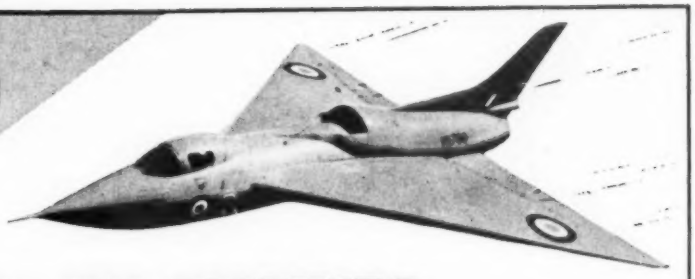
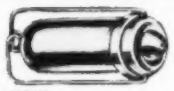


JETEX JET ENGINES



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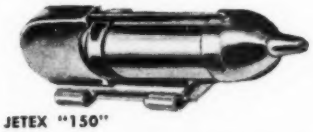

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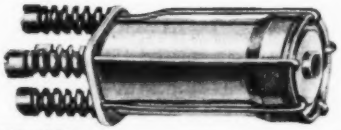

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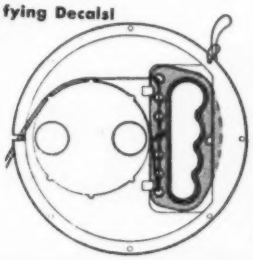

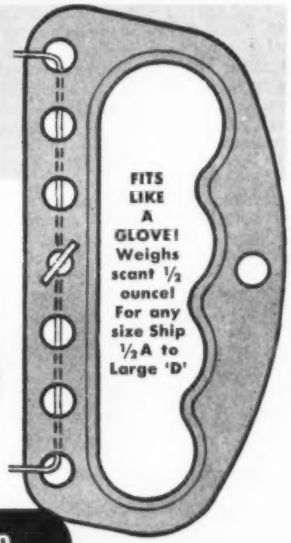

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Aside from being low-winged, the new Boeing pursuits were fabricated entirely of smooth metal. The thin-sectioned, low aspect ratio wing was externally braced with streamlined stainless-steel lift and drag wires. Landing gear was of the treadle type, equipped with Boeing oleo shock absorbers, completely enclosed in "trousers." The 26" tires were encased in metal fairings.

The beautifully streamlined fuselage carried a P & W *Wasp* SR-1340E engine, rated at 522 hp, in its nose. The cockpit and wing both were situated well forward, while at the rear was a cantilever empennage. The fixed vertical fin was set slightly off center to the left to counteract torque. While neither rudder nor elevator was aerodynamically balanced, the latter did have a hinge overhang intended to reduce stick forces.

Dimensions of the *XP-936* almost guaranteed it would be a "hot" airplane. Wing span was 28'; length was 23'5"; and wing area only 150 sq. ft. Design empty weight of 2,070 lbs., and gross design weight of 2,740 lbs., gave the *XP-936* a wing loading of a little more than 18 lbs/sq/ft., and a power loading of 4.95 lbs. The result was a top speed of 222 mph; a cruising speed of 190 and a landing speed of 65 mph. These little fighters climbed at 2,260 ft/min., had a service ceiling of 30,700 ft., and a range of 358 mi.

In its day, this performance was outstanding. It led the Air Corps to contract for 111 additional aircraft, to be designated Boeing *P-26A*. Contract was dated January 11, 1933, first airplane delivered December 16, 1933. These carried the Boeing model number 266.

Although construction went ahead, the Army complained of the ship's high landing speed. On its model 281, which it had used as a company demonstrator, Boeing installed landing flaps, demonstrated the ship to the Army and received a contract to re-work all *P-26A* airplanes already delivered and to include flaps on subsequent examples. The contract for basic aircraft was later changed to 136 airplanes. The last 25 of this order were to be designated *P-26C* for 23 ships and *P-26B* for two ships. The last of the 136 airplanes was a *P-26C*, delivered March 7, 1936.

For a peacetime project, production of the first 111 Boeing *P-26A's* was something of a miracle. Boeing's efficient methods and workmanship turned out these 111 airplanes from December 16, 1933 to June 30, 1934—about six months from the first to last ship of the order.

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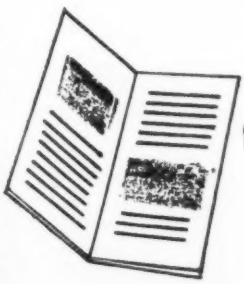

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forget these husky little fighters. They looked like fighters, a test which, even in the early Thirties, pretty much determined the type.

Ground crews never will forget them, either. Here, for the first time, was a production military aircraft, possessing all the elements of a modern pursuit plane. *P-26A* engines were the P & W *Wasp* R-1340-27, rated at 600 hp at 2,200 rpm at 6,000 ft., and supercharged. The engine was held by a steel-tube mount which was easily detached from the fuselage to facilitate maintenance. The fuselage, of semi-monocoque construction, was made up of aluminum alloy bulkheads, longerons, skin stiffeners with a smooth skin covering. The pilot compartment, last of the open cockpits on pursuit ships, was situated high in the fuselage, giving the pilot excellent visibility. Overall length of the *P-26A* was 23'7-1/4".

The monoplane wing spanned 27'11-1/2". It was constructed of built up "I" beam sections in aluminum alloy for spars and Warren truss type metal ribs covered with sheet aluminum skin. Right- and left-hand outer panels were attached to a central stub section built into the fuselage. The stubs also carried the landing gear. Unbalanced ailerons were of the high aspect ratio type, mounted on ball bearing hinges for easy and effective control. Fixed aileron trim tabs were provided. Flaps were manually operated by the pilot.

A treadle type landing gear, as installed in the *XP-936*, was incorporated in the *P-26A*. The 24" landing wheels were provided with self energizing brakes, and an 8", full swivelling tail wheel was used.

The *P-26A* was credited with a top speed of 234 mph, a cruising speed of 200 mph at 60 percent throttle, landing speed of 73 mph, absolute ceiling of 28,300 ft., and range of 635 mi. on 107 gallons of fuel. Armament was two 30 cal. machine guns, with bomb racks available for two 100 lb. bombs or five 30 lb. "torpedoes."

Army model *P-26B* ships (Boeing model 266A), of which only two were built, were powered by the P & W SR-1340-33 supercharged engine, delivering 600 hp. This particular model had a top speed of 235 mph, cruised at 200 mph, with a ceiling of 28,000 ft. and range of 326 mi. Model *P-26C*, of which 23 were constructed, was powered by the P & W R-1240-27 engine, rated 570 hp at 7,500 ft. altitude. Top and crusing speeds were the same as for the *P-26B*. Range of the "C" model was boosted to 635 mi. Armament was either two 30 caliber, or one 30 and one 50 caliber machine guns. Rate of climb was 2,360 ft/min.

While the *P-26* series was an operational ship in peace time, it did get a taste of war, for which it was built. Late in 1937, a number were sent to the Philippines. They remained until 1941, when the Japanese invasion of the Islands began.

Airways

(Continued from page 15)

good reason for making the choice. It is true that Bakersfield is 1,000 miles from Tacoma, Washington, but it is more centrally located as the distance from San Francisco is 288 miles and from San Diego 233 miles. This seems a reasonable split, since the majority of modelers are concentrated in these two areas. In past years, it has been necessary for southern area modelers to drive 500 miles to the Bay area for the semi-finals.

Modelers began arriving early Saturday afternoon, May 24, the day before the contest, and were quartered in the Rancho Bakersfield and Rio motels. A meeting was called at 10:00 p.m. Saturday night by the contest director, H. S. (Pop) Robbers. Pop laid out the schedule to the modelers, and contestants drew lots for the starting line-up. Needless to say, bull sessions ensued until the wee hours of the morning. These get togethers of modelers always produce those spontaneous good times

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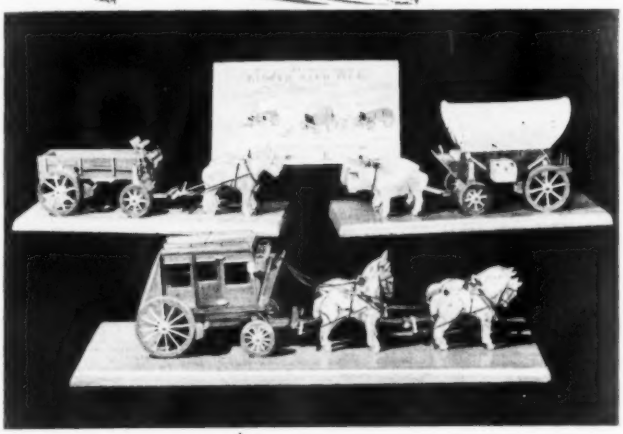

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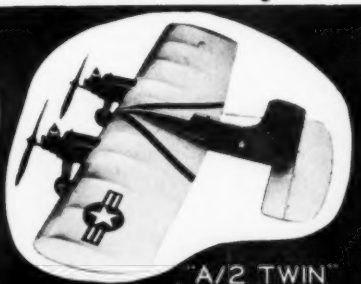

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which make contest modeling so much fun. Ed Slobod drew the number one starting position and commented that he was unaccustomed to rising before noon and didn't see how he could make it. As it turned out, he might just as well have "stood in bed."

Modelers were on the field at 4:45 a.m. Sunday, May 25, and although you could just see your hand in front of your face, good ole Ed Slobod was making test flights. How he could tell what happened to the model after it left his hand is a mystery to me, but at 5:30 a.m. he was ready to start the first round. Ed's misfortunes started early; breaking a prop, he was forced to take a delay. In the first round Joe Bilgri's model looped under power, giving everyone anxious moments, stalled in the glide, but still racked up a very nice flight of 4 min. 7.6 sec. This model featured a return gear system, large prop and clean lines. Frank Cummings' twin fuselage model created much interest. It was a bit of a problem to wind this contraption, but with the able assistance of Don Kennedy, Frank did all right. The model took off like a P-38, both props grabbing lots of air, climbed steadily and turned in a flight of 3 min. 22.1 sec. Dick Baxter, winner of the Los Angeles eliminations, had an unusual model with a front gear box driving a 14" prop at four times the motor speed. This system enabled a motor run of 3 min., giving Dick a 4-min. 18.8 sec. flight in the first round. Syd Seldon turned in the high time of the round with 4 min. 20.5 sec.

The second round was under way by 6:17 a.m. This round proved trying to many of the contestants. Syd Seldon looped his model into the ground for a delay. However, his second model saved the day, with a flight of 4 min. 44.9 sec. Frank Cummings also had trouble with his ultra lightweight model. Just as he prepared to release the ship for a second flight, he slipped slightly, bearing down on the model and breaking both landing gears. After repairs, Frank completed the second round with 3 min. 15.5 sec. Dick Baxter and Ed Slobod tangled in the second also. Good ole Ed was winding with Russell ("The Muscle") Johnson holding when out of the blue, Baxter's ship, which was taking off, collided with Slobod's second model, thus demolishing both models *and* Russ Johnson. Good Ole Ed, sportsman that he is, didn't tear Baxter limb from limb as one would suppose, but simply sat down and cried. Manny Andrade did an excellent job with Joe Bilgri's model, putting it up for a five. The round was finished by 7:14 a.m.

The third round produced two more five min. flights—one by the Bilgri-Andrade combination, which cinched a spot on the team for Joe Bilgri. The look on Joe's face, when Manny told him how many turns he intended to pack into the *Duster*, was something to see. He just stood there and quivered. Hank Cole, father of the "oh-so-long!" models also turned in a five. Hank's new ship had all its required cross-sectional area in a very thick rudder, with the stab mounted on top. The wing for this model reputedly weighs 5/10 ounce and in my opinion must have been built of compressed air. Syd Seldon maintained his fine average with a flight of 4 min. 13.5 sec. Other excellent third round flights were made by Hal Roth, Don Donahue, John Lenderman, and Lt. T. E. Bieber. The round was concluded at 7:57 a.m., including all delayed flights, a total time of 2 hrs. and 27 min. to complete 45 official flights, or approximately 3.25 min. per flight.

After the third round was over, Joe Bilgri and Syd Seldon were walking about four feet off the ground. Even Mr. Iceberg himself (Manny Andrade), looked a little elated. The last I saw of Ed Slobod he had requested a delay until next year and was sitting cross-legged in the carnage that was his model, mumbling "I was robbed," and chewing distractedly on a 20" prop.—**Virgil D. Cone.** THE END.

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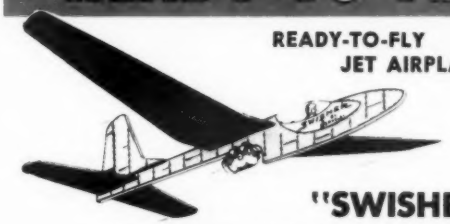

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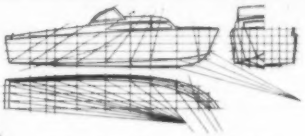

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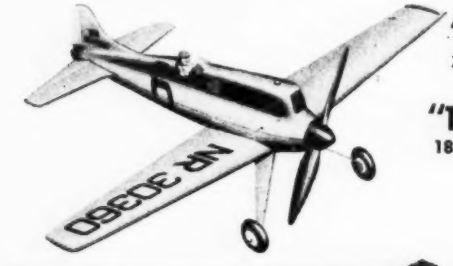

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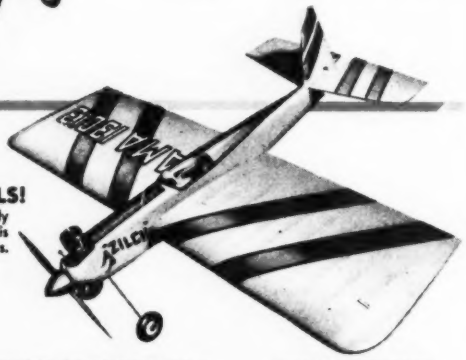

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AMA News

(*Continued from page* 32)

30:0.0. Perfect flights made by Gary B. Christiansen, Salt Lake City, Utah, on April 20, at the Bakersfield Gas Modelers' 14th Annual Contest. Gary's model, powered by a Torp 32, weighed 33 ozs. and was an original design called the *Perfidio 30*. The model has 614 sq. in. wing area, 277 sq. in. stabilized area, and 21 sq. ins. rudder area. It was launched R.O.G. using a single wheel gear, has a square fuselage cross-section with cabin-pylon wing mount, tapered wing tips and tapered elevator.

PAA Load, Class 1/2A Junior — 1:06.6. Flights made by John B. Dottellis, Washington, D. C., on May 4, at the Potomac Md., Free Flight Record Trials. Model used was a *PAA Master* powered by a Torp .049 with a 5-1"D x 4"P prop.

PAA Load, Class AB Senior — 5:19.8. Flights made by Sy VosGerau, Miami, Fla., on May 25, at the Tropic Aeros Pan American PAA Load Meet. The model, an original design, was powered by a Torp 19 with a Tornado 9"D x 4"P prop.

PAA Clipper, Cargo—Open 10 ozs., 40.1 secs. Flight made by Donald C. Broggini, Mineola, N. Y., at the New York Plymouth Dealers' Meet on May 18. Don's model was his own-designed flying wing, *Cargowing*.

▸CONTESTS

AUGUST

3 — *Waynesboro, Pa.* Class AA Second Annual U-Control Gas Model Meet at Waynesboro for beauty-scale, CL, CLS, combat, and RC. John A. Otter, Contest Director, Route 3, Waynesboro.

3 — *Minneapolis and St. Paul, Minn.* Class AAA PAA Load Meet for PL, CLS, CC, and RC exhibition. Lytton Calrow, James Lightfoot, and Walter Billett, Contest Directors, 2548 Nicolett Ave., Minneapolis.

3 — *Cleveland, O.*—Class AA 5th Annual 1-1/2A Free Flight Contest. John W. Grega, C.D., 10422 Gay Ave., Cleveland 5.

10 — *DeKalb, Ill.* Class AA DeKalb Cloud-Dusters' Annual Flying Circus for FFG and OR. Dutch Hess, C.D., 137-1/2 E. Lincoln, DeKalb.

10 — *Lancaster, Pa.* Lancaster Model Airplane Contest. Paul Liller, C.D., 213 E. Ross St., Lancaster. Pending.

10 — *Hamburg, N. Y.* Class AAA 2nd Annual Model Airplane Meet for CL, CLS, FFG, and RC. Joseph W. Friebis, C.D., 67 Raymond St., Hamburg.

10 — *Hartford, Conn.* Class AAA Connecticut Control Line Championships for CL, CLS, CLFS, and combat. Richard Matava, C.D., 358 Prospect Ave., Hartford.

17 — *West Chester, Pa.* Pending.

17 — *Akron, O.* Class A Akron Society of Model Plane Engineers' Meet for OHLG, TLG, and OR. Entry is restricted to members of the ASMPE. Frances Alexander, C.D., 25 Mull Ave., Akron.

17 — *Key West, Fla.* Exchange Club Meet. Charles A. Fearaldo, C.D., 172-D Poinciana Place, Key West. Pending.

17 — *Salem, Ore.* Class AA Salem Model Airplane Club 14th Annual Contest for FFG and OR. Elmer J. Roth, C.D., 2080 Market St., Salem.

20-25 — *Detroit, Mich.* Class AAAA Ltd. Sixth International Model Plane Contest for OR, OHLG, FFG, CL, CLS, CLFS, TR, Navy Carrier, and combat events. See your nearest Plymouth dealer for information.

24 — *Moline, Ill.* Class A Iowa-Illinois Aeronautic Association Contest for control line events. Entry is restricted to members of the Iowa-Illinois Association.

Jack Stucker, C.D., 4105 14 Ave., Rock Island, Ill.

24 — *Los Angeles, Calif.* Class AA Inglewood Flightmasters' 3rd Annual 1/2 A Free Flight Scale Contest. William L. Butler, C.D., 8856 Earhart Ave., Los Angeles 45.

24 — *Louisville, Ky.* Class AAA 3rd Annual Kentuckiana Trophy Meet for CL, CLS, CLFS, combat, and FFG. For information, write: H. O. Wise, 2802 Rodman St., Louisville 8. Pending.

24, 30, 31 & Sept. 1 — *Salt Lake City, Utah.* 14th Annual Douglas Trophy Contest. Jack H. Douglas, C.D., 133 East 2nd South St., Salt Lake City. Pending.

31 — *Waterloo, Iowa.* Class AAA Prop-Twisters' Model Meet for OHLG, TLG, FFG, CL, CLS, CLFS, RC, PL, OR, and free flight scale. E. H. Fletcher, C.D., 2416 Rownd, Cedar Falls, Iowa.

31 — *Chicago, Ill.* Class AAA 9th Annual Midwestern States Championships for FFG, OR, RC, jetex, FFG, and PL. Peter L. Vacco, C.D., 4652 Milwaukee Ave., Chicago. Pending.

31 & Sept. 1 — *Pawtucket, R. I.* Class AAA 6th Annual All New England Model Meet. Arthur C. Bergeron, C. D., 55 Ricard St., Sekonk, Mass.

31 & Sept. 1 — *Crossville, Tenn.* Class AAA Seventh Annual Volunteer State Free Flight Meet for OHLG, TLG, OR, and FFG. Roy A. Stone, Jr., C.D., Crossville.

SEPTEMBER

1 — *Far Hills, N. J.* Class AA Bedminster-Far Hills Lions Club 5th Annual Control Line Meet for CL, CLS, beauty, and TR. C. Norman Welsh, C.D., Dumont Rd., Far Hills.

7 — *Lumberton, N. C.* Class AA Lumberton Model Airplane Contest for CLFS, CLS, and CL. Randolph C. Stone, C.D., 1906 Rowland Ave., Lumberton.

7 — *Defiance, O.* Class AA Maumee Valley Model Airplane Meet for CL, CLS, 1/2 A FFG, and RC. Arnold G. Schilperoot, C.D., RFD 1, Defiance.

14 — *Woonsocket, R.I.* Class A Fall Roundup for FFG, OR, CL, CLS, OHLG, and TLG. Entry is restricted to members of the Flying Fools M.A.C. Thaddeus W. Wenclawik, C.D., 204 Lincoln St., Woonsocket.

14 — *Akron, O.* Class AAA Akron Society of Model Plane Engineers' Meet for OHLG, TLG, and OR. Frances Alexander, C.D., 25 Mull Ave., Akron.

14 — *Perth Amboy, N. J.* Class AAA First Annual Flying Olympics for CLS, CL, beauty, and combat. Martin J. R. Maciag, C.D., 433 Douglas Ave., Avenel, N. J.

14 — *Harrisburg, Pa.* Class AA Central Pennsylvania Model Airplane Meet. J. Clarence Bachman, C.D., 2121 Derry St., Harrisburg.

14 — *Kansas City, Mo.* Class AA K.C. Mo-Hawks' 1/2 A Scale Free Flight Contest. S. E. Smith, C.D., 228 E. 32nd Terr. Kansas City.

21 — *Grove City, Pa.* Pennsylvania State Exchange Clubs' Meet. Pending.

28 — *Hicksville, L. I., N. Y.* Class AA 6th Annual Screamin' Demons of Long Island Meet (part two) for FFG and TLG. Bob Buragas, C.D., 255 Laurel Ave., Arlington, N. J.

FLASH! WAKEFIELD RESULTS

1.	Blomgren, Sweden	810 seconds
2.	Nilborn, Sweden	789 seconds
3.	Ellila, Finland	715 seconds
4.	Lustrati, Italy	704 seconds
5.	Bilgri, United States	695 seconds

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(U. S. Navy Designation SNJ-5)

Wingspan—¾" scale—For "19" to "33" Engines

The "T-6" has been taught more people to fly than any other airplane. Hundreds of thousands of pilots who flew this plane will thrill to see this model perform. Beautiful to look at and easy to handle. With its stunt airfoil, it can do everything in the rule book.

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MOLDED PLASTIC BUBBLE CANOPY
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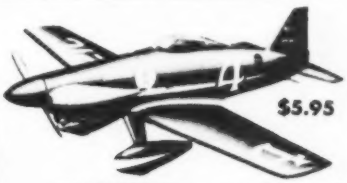
35½" Wingspan—For .29 to .65 Engines
Features "Autotrol" rudder operation, eliminating slack control lines in critical maneuvers.



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"MINNOW" Cosmic Wind
28" Wingspan—For .09 to .36 Engines
This 1½" scale Goodyear racer features "Step Keel" construction. Meets Team Racing rules.

$5.95

North American "T-28"
30" Wingspan—For .23 to .36 Engines
This new Air Force trainer makes a perfect stunt-scale design. Tricycle gear, pre-fab.

$5.95

CESSNA "195"
36" Wingspan—For .19 to .49 Engines
This beautiful 1" scale controline lightplane kit is pre-fabricated. Features "Step Keel."

$4.95

Republic "P-47 THUNDERBOLT"
40¾" Wingspan—For .29 to .65 Engines
Engine throttle control, fully automatic wing flaps, shear-pin mounts and die-cut parts.

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Betty Skelton's "PITT'S SPECIAL"
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Authentic pre-fabricated Controline design of the famous National Aerobatic Champion.

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Features retractable-extensible landing gear, throttle, flap, elevator and rudder control.

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- Carved & Hollowed Fuselage!
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- Die-Cut Ribs, Bulkheads, Etc.
- Genuine Jim Walker "U-Control"!

27" Wingspan—⅜" Scale (from factory plans)
(No deviations from scale on this model)

This is the ultimate in scale model controliners. Power it with two gas engines up to .099, and a Jetex Jetmaster "150" as a "Stinger" in the tail for extra high speed boost, just like the real "Savage". Kit includes arresting hook for Carrier Event landings. Fly high speed on all three engines, fly low speed on one engine to win in high-low speed contests.

Scale jet air intake for Jetex cooling, thrust augmenter . . . No access hatches to mar finish. Jetex unit slips out scale size jet exhaust opening with ease . . . . Full depth ply wing spar plus sheet planking amply support engine nacelles under landing impact.

FOR TWIN ENGINES PLUS JETEX . . . PERFECT SCALE!
Two .045 to .099 Engines, and Jetex 50, 100, 200, or new Jetmaster 150 unit. Adjustable balance!
(Jetex unit for reserve power & scale effect)

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For .035 to .099 Engines—38" Wingspan

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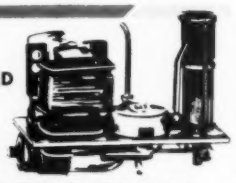
27 m.c. CRYSTAL-CONTROLLED RADIO CONTROL



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Entirely new and different! Rugged yet compact. Single hole mount. Draws 2 to 5 times less current. Operated by rubber power, it will deliver at least twice the control operating force of other escapements without "skipping." Completely self-neutralizing, it returns the control to neutral after the signal stops.

DUST-CORE TUNED Super Aerotrol RECEIVER

- Operates on either 27.2 or 52 mc. • NEW super-sensitive relay.
- NEW "locked-channel" dust-core tuning. (We have shipped the sample receivers across the country and to Europe without the frequency changing!
- Light in Weight, 2¾ oz. less batteries.
- Simple super-regenerator circuit, 100% dependable.

Kit includes: Finished, tested sensitive relay; finished dust-core tuner; drilled bakelite base with condensers and eyelets attached; all electrical components, condensers, resistors, coils, chokes and potentiometer; all necessary contacts, and color-coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included.

Kit— **$13.95**

Crystal-Controlled Super Aerotrol TRANSMITTER

- Completely portable—Self contained—No separate antenna—No external Batteries! • Operates on 27.255 mc. • Weighs 3.5 lbs.

Kit includes all necessary parts (except tube and batteries): Precision Ground Crystal; Painted Metal Cabinet; Finished Sectional Antenna; stamped and formed chassis with all holes punched; all necessary components, resistors, condensers, coils and chokes; color coded wiring. Can be assembled in less than two hours. Complete building and operating instructions are included—

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Low in cost, manufactured specifically for use with Super Aerotrol equipment. O-3 Milliameter for use with Super Aerotrol Receiver. O-50 Milliameter for use with Super Aerotrol Transmitter.

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Includes Transmitter, Receiver, Escapement (less batteries and tubes).

XFG-1	Receiver Tube	$3.50
3A5	Transmitter Tube	3.50
DE-105K	Escapement Kit	2.95

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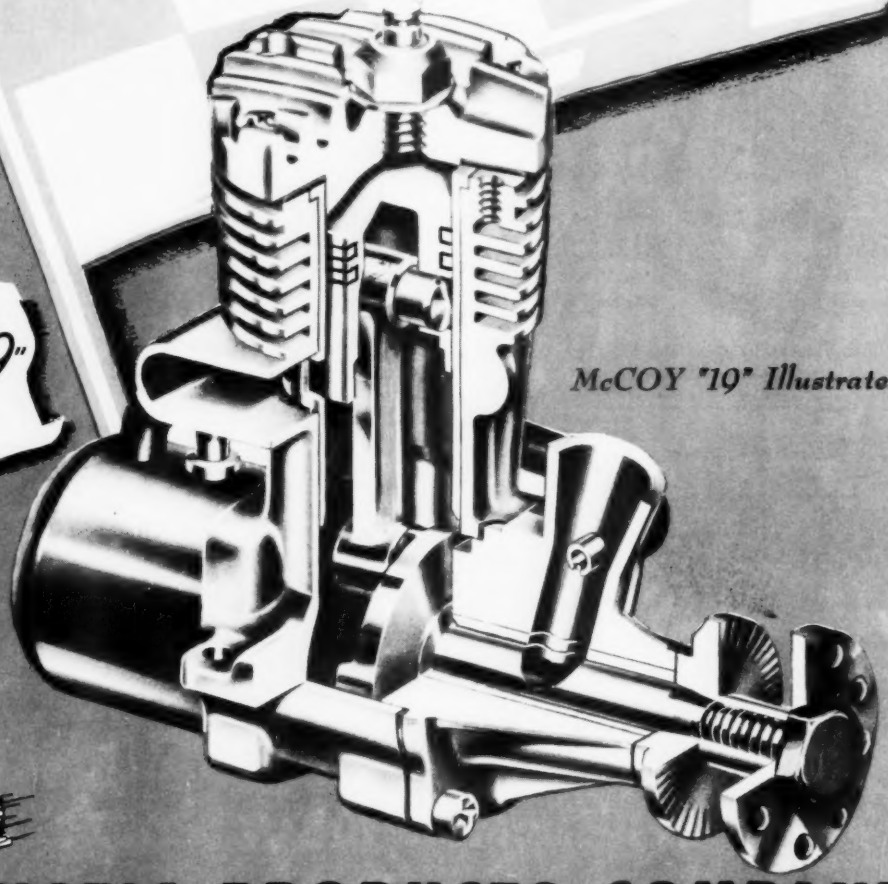

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